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FUNCTIONAL CAPACITY OF THE LIVER

COMPARATIVE MERITS OF THE FIVE MOST POPULAR TESTS

WILLIAM EGBERT ROBERTSON, M.D.
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AND
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The importance of the liver from a metabolic standpoint, the additional light thrown on its functions, especially by Bollman and Mann,[1] and, frequently, the unsatisfactory results following gallbladder operations of various types suggest the importance of attempts to determine liver function. In the light of present knowledge, the multiplicity of liver functions has been urged as a criticism of any test of the activity of the liver as a whole; hence in our work we have employed several methods at the same time, with a view to obtaining comparative results. Realizing the ebb and flow of hepatic congestion in late cardiac cases, we selected this group as one permitting gradations in hepatic function. From this our interest spread to other cases of primary and secondary hepatic dysfunction. It is of interest to note that occasionally a surgeon will be bold enough to admit his dissatisfaction with the end-results of operative procedures on the biliary tract and urge the importance of studies of the liver function prior to operative intervention. In a staff meeting at the Jefferson Hospital, Dr. Thomas Shallow, professor of surgery, fully two years ago stressed the importance of preoperative study of the liver, especially in nonjaundiced patients with diseases of the gallbladder, even though they appeared to be good operative risks. Previously, he had a certain unexplained mortality, which later became more clear to him when preliminary dye tests yielded high retention without corresponding clinical evidence. Later, in such instances patients who failed to respond to dietetic and other remedial measures were refused operation unless immediate exigencies demanded it. Laird, Brugh and Wilkerson [2] contributed a suggestive paper along this line. They stated explicitly that "functional studies afford data that make the diagnosis of cholecystitis cases, the handling of these cases while in the hospital, and the prognosis of final results more a matter of information and not so much a mere guess." These authors stated that it is not a question of technic, for even the master surgeon has his share of poor end-results.

Walters and others of the Mayo Clinic,[3] have likewise stressed the study of hepatic function preliminary to operation. Perhaps, then, a study of liver functions and their clinical applications becomes a matter of even greater importance in the surgical field than to the internist. The enormous functional capacity of the liver under normal conditions and the fact that, experimentally, large portions of the liver of a dog may be removed without definite clinical results have been advanced as arguments against the validity of functional tests of the liver.

It is incomprehensible to entertain a concept of a normally functioning liver in the presence of such extreme hyperemia as is met with in cases of decompensated heart disease or in the dysfunctions accompanying disease of the biliary tract and even in disturbances of the alimentary tract. If Bauer [4] and Shay [5] are correct in their contention that a high reading for galactose is indicative of hepatic dysfunction, our group of cases of giardiasis attests the importance of gastrointestinal, disturbing influences on hepatic function.[6]

Concerning the tests themselves, each depends on some definitely known function of the liver or on a function that is less positively established.

The icteric index [7] and van den Bergh test [8] depend on pigment formation by the liver and other structures and the inability of the liver to excrete it wholly or in part. Bromsulphalein [9] retention revolves about some interference with the excretory function of the liver. The galactose tolerance test is bound up with the glycogenic activity of the liver. Urobilinogen [10] in the urine is based primarily on the normal transformation of urobilinogen into bilirubin by the cells of the liver. In hepatic dysfunction this fails more or less.

If the foregoing statements are true, the thought must intrude itself that each of the respective tests has a measure of specific significance. As a result of our own studies we can scarcely subscribe to this

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Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the authors' reprints.

Assisted by Mr. Philip Gerber, B.A., M.A., and Mr. James Bloom, junior students in the medical department of Temple University.

Read before the Section on Gastro-Enterology and Proctology at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 13, 1932.

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6. Lyon, B. B. V., and Swalm, W. A.: Giardiasis: Its Frequency, Recognition, Treatment and Certain Clinical Factors, Am. J. M. Sc. **170**: 348 (Sept.) 1925.
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10. Wallace, G. B., and Diamond, J. S.: The Significance of Urobilinogen in the Urine as a Test for Liver Function, Arch. Int. Med. **35**: 698-725 (June) 1925.

view in its entirety. For instance, the determination of urobilinogen as a routine procedure is distinctly of less value than the determination of the icterus index. The van den Bergh reaction, at least qualitatively, presents no definite value over the simpler and more readily applicable icterus index. Carotene and allied pigments do not serve as troublesome features in estimating the icteric index, provided simple dietary restrictions are practiced (withholding especially carrots, eggs and oranges).

We are of the opinion, however, that in only an emergency, the rare and unusual case, should the patient be operated on without first determining the liver functions, especially in any case in which, for any reason, liver dysfunction is a possibility. A clinical appraisal alone is not sufficient. It should be a routine procedure in cases of disease of the biliary tract, in all forms of hepatic cirrhosis, in malignant conditions of the alimentary canal [11]—tumors of the stomach and, especially, those of the bowel—and in any case of

TABLE 1.—*Group 1: Cardiac Diseases*

Case	Sex	Size of Liver*	Diagnosis	Bromsulphalein† 30 M.	Bromsulphalein† 60 M.	Icterus Index, Units	Van den Bergh† Direct	Van den Bergh† Indirect	Galactose†	Urobilinogen†
			5 Mg. Dose							
1	M	3.5 cm. B.C.M.	Myocarditis with vascular disease with decompensation	15	11	8	.....	0.1	5.5	1:10
1A‡	M	(?)	Same as foregoing but now compensating; no ascites; no edema	6	3	4	Negative	...	3.5	Negative
4	M	7.5 cm. B.C.M.	§Chronic myocarditis; chronic interstitial nephritis; after 10 days of treatment	..	0	4	Negative	...	1.5	1:10
6	M	7 cm. B.C.M.	Chronic myocarditis; decompensation	17	..	9	Negative	...	1.5	1:10
8	M	7 cm. B.C.M.	Advanced myocardial disease with decompensation	..	20	9	Negative	...	1.8	1:10
10	M	3 cm. B.C.M.	#Myocardial degeneration; cardiac hypertrophy and dilatation; decompensation	28	20	14	Negative	...	2.3	1:20
12	M	3 cm. B.C.M.	Hypertensive, cardiovascular disease; decompensation	Hemol.	..	6	Negative	...	1.5	1:30
14	F	8.5 cm. B.C.M.	Rheumatic heart disease; mitral valvular disease	20	5	12	Delayed	0.7	1.7	1:10
18	F	.....	Mitral stenosis; pregnant 5 months +	18	14	8	Delayed	0.4	3.7	1:20
19	M	2 cm. B.C.M.	Myocardial sclerosis	..	5	6	Negative	0.3	1.5	1:20
34	M	Normal	Myocardial degeneration; bronchial asthma	10	5	7	Delayed	0.6	1.5	1:30
44	M	3 cm. B.C.M.	Rheumatic endomyocarditis; secondary anemia mod.	12	7	3	Negative	...	2.1	1:10
70	F	8 cm. B.C.M.	‖Chronic myocarditis with decompensation	28	22	27	Biphasic	2.5	3.1	Negative
			2 Mg. Dose							
89	F	8 cm. B.C.M.	Rheumatic myocarditis; mitral disease and decompensation	5	0	6	Negative	0.1	6.3	Positive
108	M	N.P.	Heart block	4	0	6	Delayed	...	1.5	Negative

* In this and the succeeding tables, the size of the liver is that at the time of admission and not necessarily on the day of the test; cm. B.C.M. indicates cubic centimeters below the costal margin, and N.P. indicates not palpable.

† In this and the succeeding tables, bromsulphalein was measured as per cent of retention; 30 M. indicates 30 minutes; 60 M., 60 minutes; Van den Bergh direct (qualitative), indirect (quantitative); galactose in grams excreted; urobilinogen in the dilutions specified.

‡ Same patient as in case 1, three weeks later.

§ The tests were performed after ten days of treatment. The patient was compensating; formerly he had been decompensated.

Diagnosis proved at autopsy or operation.

‖ Ascitic fluid at sixty minutes tested for presence of bromsulphalein and found negative. Diagnosis proved at autopsy or operation.

TABLE 2.—*Group 2: Cardiovascular Renal Disease*

Case	Sex	Size of Liver	Diagnosis	Bromsulphalein 30 M.	Bromsulphalein 60 M.	Icterus Index, Units	Van den Bergh Direct	Van den Bergh Indirect*	Galactose	Urobilinogen
			5 Mg. Dose							
11	F	Normal	Cardiovascular renal disease; pernicious anemia	6	0	13	Delayed	0.3	5.3	1:10
15	M	7 cm. B.C.M.	Chronic interstitial nephritis; arteriosclerotic cardiovascular disease	18	13	6	Delayed	0.5	3.4	1:30
17	M	Normal	Cardiovascular renal disease	0	0	5	Negative	...	1.5	1:10
21	M	Normal	Chronic interstitial nephritis; chronic myocarditis with hypertension	2	2	4	Negative	...	1.7	1:10
42	M	Normal	Cardiovascular renal disease	12	3	4	Negative	0.3	3.0	1:10
46	M	.....	Cardiovascular renal disease with hypertension	11	3	6	Negative	0.1	1.9	Negative
50	M	N.P.	Cardiovascular renal disease with hypertension	11	0	7	Delayed	...	2.1	1:10
59	M	Normal	Cardiovascular renal disease with hypertension and coronary thrombosis	8	2	4	Negative	...	1.5	Negative
60	M	2 cm. B.C.M.	Cardiovascular renal disease with hypertension	4	1	5	Negative	0.1	1.7	1:10
71	F	(?)	†Chronic myocarditis with decompensation and chronic interstitial nephritis	14	8	4	Negative	...	8.2	Negative
			2 Mg. Dose							
26	M	N.P.	Cardiovascular renal disease	1	0	..	.....	...	1.5	Negative

* In explanation of the failure to do an indirect van den Bergh test in all cases in which the direct reaction was negative, we wish to state that in a portion of the study the former appeared to be less important because of the frequency with which they fell within normal limits. Therefore, in certain cases indicated as .., this test was omitted.

† Ascitic fluid at sixty minutes found negative for bromsulphalein dye.

Haldane has written a semipopular article entitled "On the Advantages of Being One's Own Guinea Pig." Unfortunately, the idea has not become generally accepted, so that in a general hospital, where venesections, intravenous therapy, chemical analysis of the blood and determinations of retention of various dyes are frequently done, some opposition is leveled against any and every one who for any reason desires to make additional punctures. For this and other reasons, therefore, it will be noted that all five tests were not performed as routine measures on every patient.

marked gastro-intestinal disturbances that may require surgical intervention. If dysfunction is revealed, it would seem ill advised to employ ether or chloroform as an anesthetic, and all such patients should be given buffered dextrose by vein and a diet consisting only of milk and carbohydrates. The observations of various French observers reveal that dextrose by vein increases the detoxifying power of the liver; Mann and his associates have demonstrated beyond cavil, in the

11. Bargen, J. A., and Rankin, F. W.: Tests of Hepatic Function in Carcinoma: Their Value in Cases of Neoplasm of Colon With and Without Metastasis to Liver, Ann. Surg. **91**: 225-232 (Feb.) 1930.

experimental animal, that carbohydrates restore and preserve liver functions, even after considerable damage has been done to the liver, while proteins, and especially meat extractives, exercise a pernicious and even a rapidly fatal action in patients with seriously damaged livers. Hence the evidence strongly supports the view that in certain surgical cases the test of liver functions doses and when danger threatens. In cardiac cases it becomes an aid in prognosis, and in preascitic cases of hepatic cirrhosis, a measure of the severity of the disease and a criterion of the value of dietetic or other therapeutic measures. In any malignant case in which protein degradation may involve liver function, it may prove of prognostic importance. Several relatively

TABLE 3.—*Group 3: Hepatic Diseases*

Case	Sex	Size of Liver	Diagnosis	Bromsulphalein 30 M.	Bromsulphalein 60 M.	Icterus Index, Units	Van den Bergh Direct	Van den Bergh Indirect	Galactose	Urobilinogen
			5 Mg. Dose							
5	F	Normal	*Chronic hepatitis	..	..	6	Negative	...	2.0	1:10
51	F	Normal	*Chronic hepatitis; hepatic cirrhosis	3	0	4	Negative	...	1.5	1:10
63	M	.....	*Hepatic cirrhosis	9	2	10	Delayed	0.5	1.6	1:5
67	F	5 cm. B.C.M.	*Chronic hepatitis; cholecystitis (chronic calculus)	17	11	15	Negative	0.3	1.6	Negative
75	M	Normal	Portal cirrhosis, chronic myocarditis	..	..	7	Negative	...	3.6	Negative
			2 Mg. Dose							
83	F	N.P.	†Atrophic cirrhosis; chronic cholecystitis	15	8	12	Negative	...	...	....
83A	F	N.P.	†Atrophic cirrhosis; chronic cholecystitis	8	2	5	Negative	...	...	1:10
123	F	N.P.	Same case as foregoing one, 9 months after operation	3	1	5	Negative	...	1.5	Negative
88	M	N.P.	Cirrhosis of liver; chronic myocarditis; chronic nephritis, ascites	20	14	7	Delayed	...	5.7	1:380
91	M	.....	*Laennec's cirrhosis with ascites	16	7	6	Negative	...	10.2	1:10
98	F	N.P.	†Subacute yellow atrophy	75	75	95	Immediate	8.0	8.4	....
102	F	N.P.	‡Atrophic cirrhosis; chronic cholecystitis	10	5	6	Delayed	...	1.7	Positive
106	F	N.P.	§Subacute yellow atrophy	100+	80	100	Immediate	9.0	4.1	Positive
124	F	N.P.	#Same case as foregoing one, 7 months after operation	12	5	4	Negative	...	...	....
115	M	N.P.	Cirrhosis, syphilitic (?); nephritis; arteriosclerosis	45	30	25	Immediate	3.2	...	....
116	M	N.P.	*Laennec's cirrhosis	18	12	6	Delayed	...	8.1	Negative

* Diagnosis proved at autopsy or operation.
† Case 83, postoperative (cholecystectomy). Case 98, subacute yellow atrophy two weeks later; see case 106.
‡ Diagnosis proved at autopsy or operation. Postoperative case.
§ Cholecystography revealed good gallbladder shadow. Diagnosis proved at autopsy or operation.
# Biopsy performed (case 106).

TABLE 4.—*Group 4: Extrahepatic Biliary Diseases*

Case	Sex	Size of Liver	Diagnosis	Bromsulphalein 30 M.	Bromsulphalein 60 M.	Icterus Index, Units	Van den Bergh Direct	Van den Bergh Indirect	Galactose	Urobilinogen
			5 Mg. Dose							
7	M	.....	Cholecystitis; possible cholelithiasis; syphilis	3	0	5	Negative	...	3.0	1:20
9	F	2.5 cm.	Cholecystitis; mass around common bile duct	..	35	200	Immediate	7.0	1.5	1:20
16	F	.....	*Cholecystitis; cholelithiasis; visceroptosis	13	6	4	Negative	...	1.1	1:10
22	F	N.P.	*Chronic catarrhal cholecystitis	2	2	4	Negative	...	2.2	Negative
25	F	N.P.	*Chronic cholecystitis and cholelithiasis	26	2	14	Delayed	0.6	1.6	1:10
27	F	N.P.	Cholecystitis	18	15	8	.....	0.25	1.8	1:10
29	F	N.P.	Cholecystitis; arthritis deformans	..	8	6	Negative	0.2	1.8	Negative
32	F	Normal	*Cholecystitis and cholelithiasis	9	2	4	Negative	0.1	1.5	1:20
36	F	Normal	*Cholecystitis and cholelithiasis	9	2	6	Negative	...	1.5	1:10
41	M	N.P.	*Chronic cholecystitis	1	0	5	Delayed	0.5	...	....
45	M	N.P.	Catarrhal jaundice	26	1	13	Negative	...	3.1	1:20
55	F	1 cm. B.C.M.	*Chronic cholangeitis; postoperative adhesions	11	5	13	Negative	1.0	1.5	1:10
57	F	3 cm. B.C.M.	Cholecystodochitis	..	..	5	Negative	...	1.6	1:10
61	F	3 cm. B.C.M.	Cholecystitis and cholelithiasis	40	40	40	Immediate	4.0	3.4	1:30
68	M	5 cm. B.C.M.	Chronic cholecystitis	..	0	6	Negative	...	1.5	1:10
			2 Mg. Dose							
80	F	N.P.	Cholelithiasis	0	0	6	Negative	...	1.5	Negative
84	F	N.P.	*Chronic cholecystitis; appendicitis	0	0	3	Negative	...	...	....
84A	F	N.P.	†Chronic cholecystitis; appendicitis	0	0	4	Negative	...	...	Negative
86	F	1 cm. B.C.M.	Chronic cholecystitis	6	0	6	Negative	...	1.5	Positive
94	F	N.P.	Cholecystitis; jaundice	37	32	60	Immediate	2.0	2.3	1:40
95	M	Normal	*Acute perforated phlegmonous cholecystitis	..	..	..	.....	...	3.1	Negative
99	F	5 cm. B.C.M.	Subacute and purulent cholecystitis; carcinoma of gallbladder (?)	0	0	3	Negative	...	1.5	Negative
100	F	N.P.	Cholecystitis; midepigastric mass (?)	0	0	3	Negative	...	1.7	Negative
103	F	N.P.	‡Chronic cholecystitis and appendicitis	0	0	4	Delayed	...	1.6	Negative
105	F	N.P.	Cholelithiasis	5	4	6	Negative	...	1.5	Positive
118	F	N.P.	Chronic cholecystitis; chronic constipation	0	0	4	Negative	...	...	....
119	M	N.P.	Catarrhal jaundice	65	58	35	Immediate	5.2	...	....
125	M	N.P.	Chronic cholecystitis and hepatic cirrhosis (2 weeks before operation)	13	10	50	Biphasic	...	1.5	1:15
126	M	8 cm. B.C.M.	Obstructive jaundice; cholelithiasis or carcinoma at head of pancreas	90	80	95	Immediate	7.5	3.8	Negative

* Diagnosis proved at autopsy or operation.
† Postoperative.
‡ Postoperative case. Diagnosis proved at autopsy or operation.

is imperative. Equally obligated, morally at least, is the physician who is called on to treat a patient with syphilis by intravenous injections of organic arsenicals. Increasing damage sustained by the liver during successive injections can be readily measured by the icterus index and bromsulphalein. In such instances the test of function may determine whether it is justifiable to use the drug at all, or, if used, the interval between simple, non-time-consuming tests in any given case, performed at intervals, afford opportunities for comparative judgment. When to such tests is added the clinical sense of a trained observer, the patient has been surrounded by the greatest measure of safety that can possibly be given, admittedly an obligation on the part of all those who minister to the health of others.

Of the total number of cases studied (one hundred and eighteen in all), some with more than one test, thirty-one came to operation and proved the correctness of the tests performed. Biopsy established the diagnosis in two cases. Two cases came to necropsy, and the pathologic changes present substantiated the laboratory tests.

INDIVIDUAL GROUPS

The following groups were studied:

Group 1.—In view of the fact that the cardiac cases were studied at different stages of decompensation, we did not compare the bromsulphalein retention values with each other, but rather compared the retention with the clinical condition at the time the test was made. From these estimations we determined that, as a rule, the dye retention and icteric index closely followed the clinical condition.

Bernheim [7] stated that the icteric index, as shown in her forty-one cases, varies directly with the degree of decompensation. We agree with this; for example, case 1 (table 1), in which the tests were first done when there was decompensation, gave high figures, but when checked three weeks later, while compensating, with the clinical condition much improved, the figures fell within normal limits.

The van den Bergh reaction was of little significance in this group.

Urobilinogen was normal throughout and of little value in this group of cases.

Group 2.—The outstanding feature of this group was the high estimation obtained for the galactose tolerance test in four of the ten cases. Decompensation with ascites seems to play an important part, as was noted in group 1. The other tests were not of much significance in indicating liver dysfunction in these cases, although clinically we expected higher figures.

Group 3.—Of twelve cases of cirrhosis or subacute atrophy of the liver, ten showed estimations for dye retention higher than normal. With the 2 mg. dose, the thirty minute readings ranged from 8 to 100 per cent, and the sixty minute readings ranged from 2 to 80 per cent.

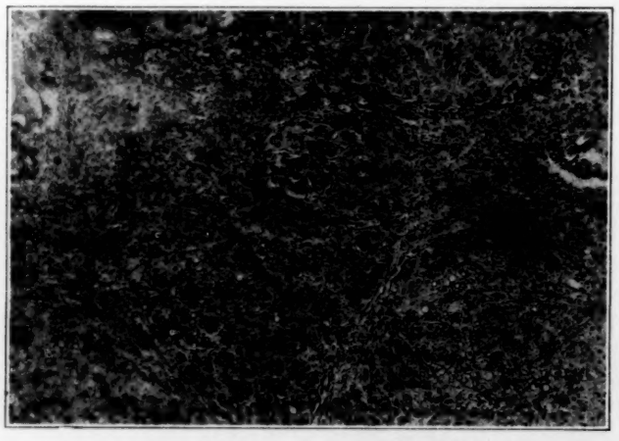

Fig. 1 (case 98, table 3).—From a case of subacute yellow atrophy of the liver. Fragment of liver removed at operation. Patient still living and symptom-free. Note the areas of collapse of the parenchyma as indicated by the bundles of connective tissue which course through the field. Near the center, in a particularly broad fibrous area, infiltrated by many mononuclear leukocytes, is a nodule of regenerating liver cells.

The two patients giving normal dye retention had been operated on several years previously, and the gallbladders had been removed. The liver in each case revealed definite cirrhotic changes at the time of operation. The operative intervention, together with careful follow up treatment, probably was responsible for the return of normal function.

In this same group of twelve cases, four showed a normal icteric index (from 4 to 6 units), while the index in the other eight cases ranged from 7 to 100 units.

The van den Bergh estimations in these cases agreed approximately with the other findings.

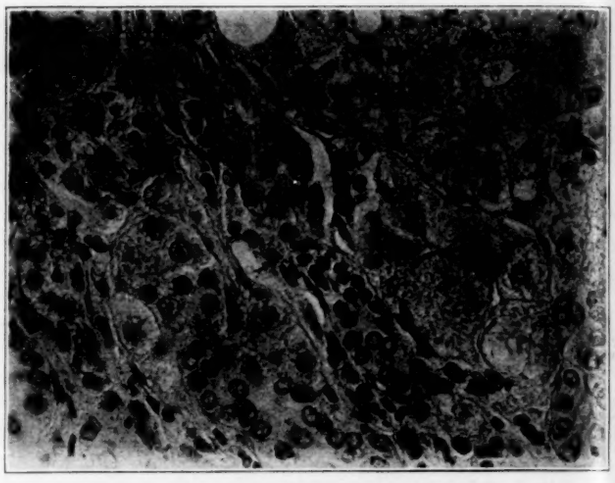

Fig. 2.—Same as figure 1, under higher magnification. Note the character of the liver cells. The cytoplasm is granular. Specific stains reveal many droplets of fat. The nuclei are indistinct or absent in many cells (karyolysis).

Of the entire group, only one gave a high urobilinogen reading (1:380).

Group 4.—This group of twenty-six cases is composed of twenty-three patients with diseases of the gallbladder, with or without lithiasis; three of them had obstructive jaundice. Of the twenty nonjaundiced patients with disease of the gallbladder, all but four failed to show bromsulphalein retention, and none showed high figures.

The icteric index agreed in general throughout, as did the van den Bergh reaction and the galactose tolerance.

The urobilinogen estimations were normal throughout.

Of the two patients with catarrhal jaundice, one gave a reading for galactose of 3.1, while the other left the hospital before this test was performed. Thus the importance attached to this test in acute catarrhal jaundice by some observers could not be evaluated.

Group 5.—In this group all tests seemed to run parallel, more so in fact than in any other group, with the exception of urobilinogen, which was positive in only four cases. About 60 per cent of the cases were associated with obstruction, in which cases a high dye retention and serum bilirubin would be expected.

In three cases of carcinoma with metastasis to the liver (cases 13, 72 and 81), markedly increased bromsulphalein retention was the only abnormal finding. In such cases, in addition to a high retention, Diamond [13] found increased urobilinogen before appreciable jaundice occurred.

Groups 6 and 7.—As a rule, in cases of intestinal disease the results were negative for all five tests.

13. Diamond, J. S.: The Value of Routine Estimations of Blood Bilirubin, Am. J. M. Sc. 176:321 (Sept.) 1928.

In only one of the five cases of giardiasis did the dye retention, icteric index and van den Bergh tests all give high readings. Cholecystitis was present.

Group 8.—In the one case of hyperthyroidism, a high degree of dye retention was observed, whereas all other tests gave normal results. The liver in this case was slightly enlarged.

Of the cases of diabetes mellitus, the galactose test was performed in only one, and was found to give a high result. This test was omitted in the other cases of diabetes because of the high blood sugar present. The three other tests, however, were performed in all of these cases and were negative throughout.

Group 9.—As a whole, this group was intended to establish "normals." A few of the cases, however, were tested because of definite indications of possible liver damage, chief among which were cases 39, 48, 66, 74, 78 and 113.

Case 74: Jaundice following malarial therapy for dementia paralytica. This case gave very high figures for all tests done. It is of interest in that the tests were repeated one year later (see case 113), at which time the results were found to be negative. This indicates a high degree of recovery of the liver after extensive damage.

Case 78: Arsenical, acute yellow atrophy. This case gave very high readings for all tests. It stresses the importance of testing for liver damage, without jaundice, before attempting arsenical therapy.

Case 39: Pernicious anemia with posterolateral sclerosis. This case supports Bernheim in her conclusions that primary anemias manifest high icteric indexes compared with the low indexes of secondary anemias. The van den Bergh reaction was delayed and quantitatively lower than expected.

Case 48: Hepatic intestinal toxemia. This case did not agree with Diamond's values for the van den Bergh

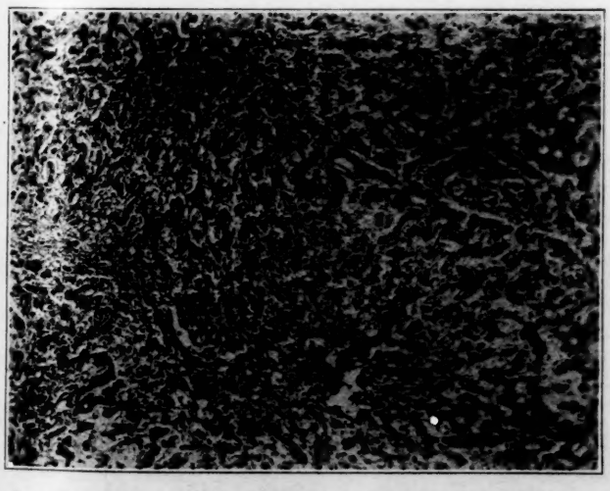

Fig. 3 (case 10, table 1).—From a case of chronic myocardial disease. Note the degree of degeneration of the liver cells and the areas of collapse fibrosis.

test and urobilinogen (latent jaundice) in that all the tests gave normal findings throughout.

Case 66: Marked secondary anemia. Our findings in this case were at variance with Bernheim's view, in that it gave a high icteric index reading. In secondary anemia she expects a low reading. The high bromsulphalein readings in this case were probably the result of an accompanying chronic hepatitis. With the exception of four other cases in this group, which gave moderately increased readings for dye retention for thirty minutes but negative readings for sixty minutes, normal results were obtained throughout.

CONCLUSIONS

Icteric Index.—In our estimation, the icteric index still remains one of the most valuable tests for liver function, for routine procedure. It is to be preferred

Fig. 4 (case 3, table 6).—From a case of splenic anemia. Note the extreme degenerative changes in the liver cells.

for many reasons. Chief among these is its simplicity, which makes it more practical, less time consuming and not as prone to errors as the other tests. Any potential sources of error can easily be controlled, as brought out by Bernheim. The popular objection, that carotin and other chromogenic substances interfere with accurate icteric index reading, was not borne out in our series. The objection was successfully avoided by regulating the diet before performing the test.

Van Den Bergh Test.—The qualitative van den Bergh test has been the subject of much investigation and doubt recently. Its claim to recognition, heretofore, seems to have centered about the possibility of differentiating, by its use, obstructive from toxic and hemolytic jaundice.

Experimental investigations by Mann and others, Snider[14] and Hubbard and Allison[15] have thrown much doubt on the original interpretation. This refers to the delayed, biphasic and immediate direct reactions of the test.

The chief advantage of the quantitative van den Bergh test lies in its selectivity for bilirubin, being uninfluenced by carotin and other pigments which may be present in the blood serum. Rarely have we observed any decided advantage of this test over the icteric index, and considering its greater complexity as to technic, we prefer the icteric index as more practical.

Bromsulphalein.—This series represents cases studied over a period of two years. During the first year the 5 mg. dose was employed, whereas the 2 mg. dose was used during the second year. This was done for comparative purposes. We now feel that in cases without jaundice the larger dose is to be preferred as a better test load for the liver (agreeing with Shay[5]).

14. Snider, F., and Reinhold, J. G.: A New Interpretation of the van den Bergh Reaction, Am. J. M. Sc. **180**: 248, 1930.
15. Hubbard, R. S., and Allison, C. B.: Comparison of Icteric Index and Direct van den Bergh Test, Proc. Soc. Exper. Biol. & Med. **26**: 438-439 (March) 1929.

TABLE 5.—*Groups of 25 Malignant Conditions, Intestinal Diseases and Endocrine Diseases*

Case	Sex	Size of Liver	Diagnosis	Bromsulphalein 30 M.	Bromsulphalein 60 M.	Icterus Index, Units	Van den Bergh Direct	Van den Bergh Indirect	Galactose	Urobilinogen
			Group 5: Malignant Conditions							
			5 Mg. Dose							
13	F	14 cm. B.C.M.	Gastric carcinoma with metastasis to liver	..	10	7	Negative	...	2.2	Negative
20	M	.....	Intra-abdominal malignant condition, hepatic (?)	40	36	65	Biphasic	3.5	5.7	1:20
22	M	10 cm. B.C.M.	*Carcinoma of pancreas; hydrops of gallbladder, metastasis	38	38	35	Immediate	3.5	5.4	1:40
22A	M	10 cm. B.C.M.	Same as foregoing, a week later	40	40	40	Immediate	3.6	...	....
22B	M	(?)	Same as foregoing, 2 weeks after operation	40	40	35	Biphasic	...	...	....
28	F	4 cm. B.C.M.	Carcinoma of gallbladder and liver; myocardial disease with decompression	38	32	40	Immediate	3.0	3.6	1:40
43	M	Normal	Carcinoma of esophagus	4	2	4	Negative	0.1	1.9	Negative
58	F	(?)	Intra-abdominal malignant condition	..	..	170	Immediate	12.5	1.7	Negative
69	M	5 cm. B.C.M.	*Carcinoma at head of pancreas; involvement of common bile duct	40	40	130	Immediate	30.0	7.2	1:35
69A	M	(?)	Same as foregoing, 4 weeks after operation	..	10	18	Delayed	1.3	4.0	Negative
72	F	4 cm. B.C.M.	*Carcinoma of stomach and liver	23	22	7	Negative	0.3	2.1	1:10
73	M	10 cm. B.C.M.	*Carcinoma of rectum and metastasis	40	40	60	Immediate	5.1	2.4	Negative
			2 Mg. Dose							
79	F	12 cm. B.C.M.	Carcinoma of liver	38	38	45	Immediate	6.0	5.9	1:50
81	M	8 cm. B.C.M.	Pulmonary carcinoma with metastasis to liver	30	0	4	Negative	...	1.8	Positive
96	F	12 cm. B.C.M.	Carcinoma of liver	50	40	90	Immediate	4.0	...	....
101	F	.....	Carcinoma of gallbladder with extension to pancreas	7	0	7	Delayed	...	1.5	Negative
109	M	Normal	†Adenocarcinoma of colon with metastasis to liver	6	1	6	Negative	...	6.7	Positive
122	M	N.P.	Resection for cancer of stomach 5 months after operation	0	0	6	Negative	...	3.3	Negative
			Group 6: Intestinal Diseases							
			5 Mg. Dose							
24	F	N.P.	*Chronic appendicitis	9	..	4	Negative	...	1.9	1:10
31	M	1 cm. B.C.M.	Mucous colitis	19	1	4	Negative	0.2	2.0	1:10
35	M	Normal	Spastic colitis; cholecystodochitis	22	1	4	Negative	0.1	2.1	1:10
40	F	(?)	Catarrhal colitis	2	0	3	Negative	0.2	1.6	Negative
			2 Mg. Dose							
107	M	N.P.	Influenza (intestinal); pharyngitis	4	0	3	Negative	...	4.4	Positive
120	M	5 cm. B.C.M.	*Subacute appendicitis	0	0	4	Negative	...	4.6	Negative
			Group 7: Intestinal Diseases							
			5 Mg. Dose							
49	M	2 cm. B.C.M.	Giardiasis (cholecystitis)	23	10	9	Biphasic	0.6	2.3	1:20
64	M	Normal	Giardiasis	2	0	6	Negative	...	4.2	Negative
			2 Mg. Dose							
76	M	.....	Giardiasis	0	0	4	Negative	...	4.3	Negative
104	F	Normal	Giardiasis	6	0	6	Delayed	...	3.0	Positive
110	M	.....	Giardiasis; psychoneurosis	2	0	3	Negative	...	2.2	Negative
			Group 8: Endocrine Diseases							
			5 Mg. Dose							
30	F	2 cm. B.C.M.	Hyperthyroidism	18	5	3	Negative	...	1.8	Negative
52	F	N.P.	Diabetes mellitus	5	1	6	Negative	...	...	....
54	M	1 cm. B.C.M.	Diabetes mellitus	11	5	9	Negative	Trace	7.5	* 1:10
			2 Mg. Dose							
93	F	1 cm. B.C.M.	Diabetes mellitus; diabetic neuritis	0	0	4	Delayed	...	...	....
114	F	(?)	Diabetes mellitus	1	0	6	Negative	...	...	....

* Diagnosis proved at autopsy or operation.
† Biopsy was performed. Diagnosis proved at autopsy or operation.

TABLE 6.—*Group 9: Miscellaneous Conditions*

Case	Sex	Size of Liver	Diagnosis	Bromsulphalein 30 M.	Bromsulphalein 60 M.	Icterus Index, Units	Van den Bergh Direct	Van den Bergh Indirect	Galactose	Urobilinogen
			5 Mg. Dose							
2	F	N.P.	Melancholia agitata	18	0	4	Negative	...	...	....
3	F	10 cm. B.C.M.	*Splenic anemia; hypertrophy and dilatation of heart	..	..	..	.....	...	2.5	1:20
26	M	N.P.	Chronic multiple arthritis	5	4	2	Negative	...	2.4	1:10
33	M	N.P.	Chorea; incipient pulmonary tuberculosis	19	1	4	Negative	0.3	...	....
37	M	N.P.	Peptic ulcer of esophagus	24	7	5	Negative	...	2.7	1:10
38	M	N.P.	Buerger's disease	4	0	6	Negative	...	1.3	Negative
39	M	N.P.	Pernicious anemia with posterolateral sclerosis	27	1	8	Delayed	0.1	1.5	1:20
47	M	.....	†Psychoneurosis	12	7	7	Delayed	0.3	...	....
48	F	Normal	Hepatic intestinal toxemia	..	1	6	Negative	...	2.8	1:10
62	F	Normal	Epilepsy	7	4	5	Negative	...	1.8	Negative
65	F	Normal	*Visceroptosis	8	4	5	Negative	...	2.0	1:10
66	F	Normal	Marked secondary anemia; hepatitis	15	10	8	Negative	0.3	1.5	1:20
74	M	5 cm. B.C.M.	Jaundice due to malaria therapy for dementia paralytica	40	35	35	Biphasic	4.8	3.2	1:120
			2 Mg. Dose							
77	M	N.P.	Chronic esophagitis	0	0	4	Negative	...	1.5	Negative
78	M	N.P.	Arsenical acute yellow atrophy; arsenical dermatitis	47	20	65	Immediate	7.0	3.3	1:60
82	M	N.P.	Chronic pneumonitis	0	0	4	Negative	...	2.4	Positive
85	M	N.P.	*Postoperative adhesions	9	0	4	Negative	...	1.5	1:10
87	M	.....	Chronic bronchitis and bronchiectasis; emphysema	0	0	3	Negative	...	3.8	1:20
90	F	N.P.	Psychoneurosis	0	0	3	Negative	...	1.8	....
97	M	1 cm. B.C.M.	Alcoholism	0	0	4	Negative	...	4.1	Negative
111	F	N.P.	Cerebellar tumor; gastritis	0	0	6	Negative	...	2.6	Negative
113	M	N.P.	‡Case following malaria treatment for dementia paralytica	3	0	6	Negative	...	...	....
117	M	N.P.	Postoperative adhesions	1	0	5	Negative	...	1.5	Positive

* Diagnosis proved at autopsy or operation.
† Iso-iodeikon was used here. The normal for this dye is about the same as that for bromsulphalein.
‡ Case 74, one year later; the patient was apparently in good health.

We believe that dye retention will detect impaired liver function as frequently as any of the other functional tests employed, and in our opinion this test and the icteric index determination most frequently agree with the clinical picture present. Granting proper technic there is one factor that requires further investigation before it can be explained. This refers to the few cases on record in which the dye retention was greater than 100 per cent. One of our cases (group 3, case 106) fell into this category. We believe that blood volume may be an important factor here, as intense jaundice was present in all of these cases; perhaps it is a dehydration factor.

Galactose Tolerance Test.—We feel that although this test gives too many negative estimations, we cannot exclude it when certain types of cases are being investigated. We noted high readings to be the rule in a few conditions, such as cardiac disease, when associated with decompensation; also in intra-abdominal malignant conditions usually complicated by varying degrees of biliary obstruction.

The Sumner method was employed in our quantitative sugar determinations on the urine.

Urobilinogen.—Recent investigations and case reports in the literature seem to shed much doubt on the reliability of this test as an accurate determination of liver function. We are still in the dark concerning the origin and fate of this substance in the body. In our series this test rarely went above the amount specified as normal by its proponents.[16] We were unable to isolate more than one or two in any group except in malignant conditions, of which there were four cases noted, each with biliary obstruction.

We therefore believe that as a test for liver function urobilinogen merits little consideration. The foregoing discussion must necessarily be limited to the types of cases represented in the groups mentioned and does not warrant an expression of opinion on the value of this test in differentiating catarrhal from obstructive jaundice by means of daily estimations.

ABSTRACT OF DISCUSSION

DR. JOHN A. KILLIAN, New York: The noteworthy contribution offered in this paper is that in all cases of gallbladder disease there should be included standard tests of liver function before these cases are considered from an operative standpoint. I would go further and say that in the routine preoperative biochemical analyses a liver function test should be included for all operative cases. In my urologic service the estimation of liver function as a routine procedure has been a tremendous help in the preoperative and postoperative care of surgical cases. In evaluation of liver function tests, I find it difficult to understand the authors' conclusions concerning urobilin. The authors do not state whether these determinations of urobilin were made on twenty-four hour urine or on casual specimens. The rate of excretion of urobilin varies greatly throughout the day. It has been found that if the activity is during the hours from sunrise to sunset, the maximum excretion of urobilin occurs in the afternoon hours. That has been confirmed by some of my own observations. Hence, the determination of urobilin in a casual specimen of urine is of practically no value. The estimations should be made on twenty-four hour specimens; moreover, it is well known that in catarrhal jaundice and in cardiac decompensation the rate of excretion may vary tremendously from day to day, from 0 to 1 Gm. in subsequent periods of twenty-four hours. Because of this I do not consider the excretion of urobilin negative unless the negative reaction persists for five consecutive days. Another factor is the reliability of the method used. There are two general methods for determination of urobilin. One is fluorescence and the other is coupling with diazo reagents. The method of Elman and McMaster is based on fluorescence given by urobilin, in a saturated solution of zinc acetate in alcohol. Marcussen and Hansen found that fluorescence for zinc acetate was the more dependable reaction for urobilin within the range of concentrations of urobilin found in both normal and pathologic urine. The method of Elman and McMaster is based on this procedure and for that reason is generally considered by biochemists to be far superior to the Wallace-Diamond method. Elman and McMaster, as a result of extensive animal experiments, came to the conclusion that urobilinuria is the most sensitive index of beginning impairment of liver function available. Experience with this method over six years has convinced me of the validity of this conclusion. When urobilinuria is observed in cases of cardiac disease in young children, I confine them to bed, although the icterus index may be within normal limits. The excretion of urobilin in urine may be from ten to a hundred times the normal figure. In adults, impairment of cardiac function is estimated by oxygen unsaturation of venous blood.

DR. DONOVAN C. BROWNE, New Orleans: There have been difficulties which have prevented the standardization and acceptance of the liver function tests on the same basis as the phenolsulphonphthalein test of the kidney; for example, the presence of bile in the blood precludes the use of the aniline dyes, and it is quite difficult to produce in the experimental animal, disease similar to that which occurs in man; for this reason most of the present data have been obtained through clinical observations and comparative studies on human subjects, and as a result in many instances these tests become of more prognostic than diagnostic value to the clinician. There are a few variances in the results recorded from this study with those which I have obtained. Dr. Killian's discussion has served to clarify the question of urobilinogen, I believe, but the use of galactose in my hands has not been as uniform as previously reported. Whether this is due to the particular product used or to the many factors involved in galactose utilization is a question. It is possible that the renal threshold and utilization of the sugar by other organs and tissues of the body are items to be considered. In this report, those tests more or less simple in technic have yielded as consistent results as those involving more elaborate technic, and it is important that any test which is to be widely used must be characterized by simplicity. I hope the study started by the authors will be continued, for it is through this means that the confusion which exists at present will be clarified.

DR. SIDNEY A. PORTIS, Chicago: It seems to me that the nearer one approaches a physiologic test of liver function, the more likely one is to draw some definite conclusions. Having this one thing in mind, I attempted to develop, during the last year, a test for liver function, a description of which will be published in the near future. It primarily deals with putting a patient on an acholesterol diet for three or four days, and then, without breakfast, feeding the patient a certain amount of cholesterol and taking the blood cholesterol readings every two hours, for a period of ten hours. In cases in which there was impairment of liver function, there was a definite delay of excretion of cholesterol from the blood. How accurate this test is has yet to be evaluated. I agree with Dr. Killian that in all cases of gallbladder or biliary tract disease it is very important to estimate the blood cholesterol. All are familiar with the unfortunate accidents that follow surgery of the biliary tract. I am sure that more careful preoperative and postoperative treatment, with liver function uppermost in mind, will lessen the mortality from these operations. I should like to ask the authors whether they have had any experiences with Graham's new test in which they have substituted the isomer of tetraiodophenolphthalein.

DR. J. E. HIRSH, Birmingham, Ala.: The galactose test was devised by Richard Bauer of Vienna in 1906 and was soon adopted by a number of men in this country. Most of them abandoned the test after a short time, and with the exception of Bauer himself few men have used it consistently. I spent several months with Bauer and followed his work closely. The authors have said that Bauer has been able to diagnose

16. Piersol, G. M., and Rothman, M. M.: Practical Value of Liver Function Tests, J. A. M. A. **91**: 1768-1774 (Dec. 8) 1928.

certain cases, such as cholecystitis and cirrhosis of the liver, by this test. Let me say that he has claimed to diagnose cases by combining this test with the Ehrlich paradimethylaminobenzaldehyde test for urobilinogen. This test is positive in any case of obstruction to the common duct and becomes negative at the point at which the obstruction becomes complete. I have followed thirty-seven cases diagnosed by Bauer either to the operating room or to the postmortem room and have found he was correct in 100 per cent of the cases. The galactose test is comparatively simple, but in my practice five years ago I was having some difficulty with the various types of galactose. Dr. Bauer pointed out that a positive galactose test results in cases of involvement of the entire parenchyma of the liver, such as cirrhosis, acute yellow atrophy and amyloid disease, but a negative galactose reaction is had in those cases in which there is not entire involvement of the liver. The authors gave a high figure in their series of secondary malignant conditions of the liver, and I should like to know what explanation they have for this, as the liver is only partially involved. Recently Shay and his associates in Philadelphia called attention to the fact that a higher point than that suggested by Bauer should be considered as normal. In my hands the galactose test has been most satisfactory; it is simple, there are no disagreeable features for the patient, and no contraindications exist except in diabetes mellitus.

DR. L. A. CRANDALL, Chicago: I have been interested for the last few years in tests of this kind, with especial reference to multiple sclerosis. There is evidence suggesting a certain degree of hepatic insufficiency in that disease. The method that indicates this is extremely simple. It depends on the presence in the blood of an abnormal lipase. There is in the blood normally an esterase, but no enzyme which attacks the higher lipoids, such as olive oil. However, a true lipase does appear in the blood in a certain percentage of patients with liver disease. Out of about 130 admissions of cases other than liver disease, I have found 6 with a positive lipase. In my series of liver disease I have found 80 per cent positive lipase values. In experimental animals with liver damage from any cause, the lipase is present in amost 100 per cent.

DR. GEORGE B. EUSTERMAN, Rochester, Minn.: A study of the comparative merits of hepatic functional tests serves a useful purpose when dealing with patients in whom the pathologic process is more or less obvious or for which one has histopathologic or surgical verification. An accumulating experience attests the superiority of the van den Bergh and icterus index in jaundiced patients and of the bromsulphalein test in questionable hepatic disease in the absence of jaundice. Admitting the simplicity and inexpensiveness of the icterus index test, I feel, nevertheless, that the van den Bergh test is superior to it. Third in importance is the galactose tolerance test, which promises to be an important contributing factor to the satisfactory differential diagnosis of intrahepatic (toxic, infectious and cirrhotic) jaundice and painless obstructive jaundice, the *bête noire* of the clinician. From my experience I am beginning to feel that the results of this test, when positive, signify parenchymal hepatic damage but do not necessarily point out the clinical type, for it is not infrequently positive in mechanical obstructive jaundice, especially when due to carcinoma, as well as in those conditions cited by the authors. Moreover, the galactose test may give negative results in intrahepatic jaundice of long duration and in infectious jaundice during the convalescence period. This is explained on the basis of regeneration of liver tissue. My experience with the urobilinogen test coincides with those of the authors, and this test was temporarily discontinued several years ago. In this connection I think it is more important to determine whether or not bile is actually entering the duodenum, by single or by repeated duodenal intubation. In the last analysis, clinicians must remember that all laboratory tests are merely accessory to, and not the sine qua non, of diagnosis.

DR. WILLIAM E. ROBERTSON, Philadelphia: The profession is a unit in its estimation of the need for a test for hepatic function. What we attempted to do was to present a number of tests in order that comparative observations might be made. There is some reason for comparing the liver to the kidney. There are certain types of kidney which possess increased permeability, notably the inflammatory cases. Others are semipermeable and others practically impermeable. Not all parts of the kidney are operative at the same time, and it is probable that this is equally true of the liver. This is suggested in certain cases of more or less acute yellow atrophy. One finds focal areas of acute atrophy. Why they should be picked out we do not know; but, in the kidney, areas are picked out similarly, and it has been known for more than a hundred years that glomeruli do not act in unison. The difference is, however, that in the liver the activities are intracellular; all of its ferments operate intracellularly. We are grateful to those who have participated in the discussion, and particularly to Dr. Killian, who has called attention to a probable error in our method of test for urobilinogen.

KIDNEY FUNCTION IN PREGNANCY

I. WATER DIURESIS IN NORMAL PREGNANCY

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AND
ELISABETH W. WALKER, M.A.
BOSTON

The present report deals with the responses to a water excretion test of two groups of subjects: normal nonpregnant persons, both men and women, and normal pregnant women. Similar responses from a few patients having toxemias of pregnancy have been included merely to give a vista of work in progress. The results of this work on toxemia, though suggestive, are regarded in no sense as final, and work is proceeding along this line as patients with toxemia present themselves for study.

It was soon seen by comparison of the responses to tests on subjects who were collected as a control group for the study of toxemia that there was a marked discrepancy in volume among pregnant patients who were all clinically normal. Tabulation of these tests by months of pregnancy showed that the volume capacity decreased progressively from the seventh month on. The detailed data will be given later in the article.

SOURCES

The subjects of these tests came from several sources. The nonpregnant controls were volunteers from the technical staff of the Evans Memorial of the Massachusetts Memorial Hospitals, from medical students in Boston University School of Medicine and from personal friends; the pregnant subjects were for the most part from the Florence Crittenton Home, although some were private patients. The toxic patients, a few of whose responses have been given, have been from the Robinson Memorial of the Massachusetts Memorial Hospitals. Dr. Frank Fremont-Smith has loaned us some of his material to use among the normal subjects in the control group and to illustrate the responses in artificial fever.

METHOD

Nothing new is claimed for the underlying principle of the test. Similar tests have been used by Volhard,[1] Labbé and Violle,[2] Pratt,[3] Buck and Proger[4] and

From the Evans Memorial of the Massachusetts Memorial Hospitals and the Boston University School of Medicine.

Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 12, 1932.

1. Volhard, quoted by Fishberg, A. M.: Hypertension and Nephritis, Philadelphia, Lea & Febiger, 1931.
2. Labbé, Marcel, and Violle, P. L.: Métabolisme de l'eau, Paris, Masson & Cie, 1927.
3. Pratt, J. H.: The Dilution and Concentration Tests of Renal Function, Boston M. & S. J. **195**: 203 (July 29) 1926.
4. Buck, R. W., and Proger, S. H.: The Dilution and Concentration Test of Renal Function, New England J. Med. **203**: 1283 (Dec. 25) 1930.

others in the investigation of kidney function among nephritic patients. The test in the hands of these authors presents some variations in the amount of water used and the spacing of individual doses. Volhard gives 1,500 cc. of water or weak tea, to be consumed in half an hour. Others drop the quantity to 500 cc. at one time, and still others use divided doses. The former method of using a large amount at one time has two drawbacks, in that it is less comfortable for the patient (which is an important factor in dealing with volunteer subjects) and it is more apt to cause nausea or vomiting. This is more true among pregnant women, especially those with toxemia, in whom nausea and vomiting are often prominent symptoms. As we use the test the patients are given the following directions:

On the evening before the test the patient may have 300 cc. (1½ glasses) of water with supper. No more fluid or food is to be taken until after the test. (The patient may brush the teeth and rinse the mouth, but must not swallow water.)

The patient is recumbent during the test except for the time necessary to drink and to void.

Each specimen is collected separately and labeled with the time of voiding.

The specimens are analyzed for volume and specific gravity in all cases. The last eight specimens are analyzed as well for the presence of albumin and the content of chloride and urea nitrogen. It should be noted, however, that the specimen voided at the time of taking the first dose of water is really not part of the test and is used only for control purposes. It is found advisable to do this, as patients are occasionally unintelligent or uncooperative and reactions to the test vary. Without such a precaution a large dilute specimen at the 9:30 collection (the first of the test) might be due to either ingestion of fluid before the test or to an unusually rapid appearance time of the fluid after the first dose of water. The comparison of the specific gravity of the 9:00 and 9:30 specimens will usually settle the question of unusual kidney response or deviation from the condition of the test.

TABLE 1.—*Instructions Given Subjects*

9:00 a. m.	Void and save	Drink 200 cc. of water
9:30	Void and save	Drink 200 cc. of water
10:00	Void and save	Drink 200 cc. of water
10:30	Void and save	Drink 200 cc. of water
11:00	Void and save	Drink 200 cc. of water
11:30	Void and save	Drink 200 cc. of water
12:00	Void and save	Drink no more fluid
12:30 p.m.	Void and save	Drink no more fluid
1:00	Void and save	Drink no more fluid

TABLE 2.—*Number of Cases, Plus or Minus the Differential Between Volume Ingested and Eliminated and the Percentage Elimination of the Various Groups Compared to the Combined Average of the Control Groups*

	No.	Ingested	Eliminated	Differential	Percentage of Normal Output
Controls, normal nonpregnant					
Studied	10	1,200	1,384	+184	
Assumed	10	1,200	1,316	+116	
Combined	20	1,200	1,353	+153	100
Normal pregnancy					
36th-13th week ante partum	11	1,200	1,389	+189	103
12th-9th week ante partum	9	1,200	1,043	—157	78
8th-5th week ante partum	20	1,200	1,110	— 90	82
4th week ante partum, delivery	38	1,200	905	—295	67
Delivery—4th week post partum	17	1,200	940	—260	70
5th-8th week post partum	12	1,200	1,099	—101	81
9th week post partum on	5	1,200	1,259	+ 59	92
Toxemias	6	1,200	225	—975	17

RESULTS OF TESTS

The normal controls were placed in two groups of ten subjects each. The first group was carefully studied and was normal in every way. The evaluation of the kidney function in this respect included routine examination of the urine, the twenty-four hour amount, chemical analysis of the blood, the phenolsulphonphthalein test and the Mosenthal test. The second group contained ten other subjects who were assumed to be normal. Physical examination of these subjects gave normal results in the past. The urine was normal to the routine examination. The examinations, however, of these subjects have not been sufficiently extensive nor sufficiently recent to allow of their inclusion in the "studied group." In comparing the performance of these two groups, their responses to the test now under consideration showed that the difference between them was 5 per cent. It was believed, therefore, that neither group showed enough deviation from the average of the two to be significant and that, thus, they might be combined to serve as a normal nonpregnant control. The average response of the studied group was the excretion of 1,384 cc. in the four hours of the test, whereas the assumed normals excreted 1,316 cc. The twenty controls were reanalyzed on the basis of sex. There were seven women among this group and thirteen men. The average female and male responses were identical. These results are shown in tabular form in table 2 and chart 1. The average of the combined controls (twenty tests) was 1,353 cc.

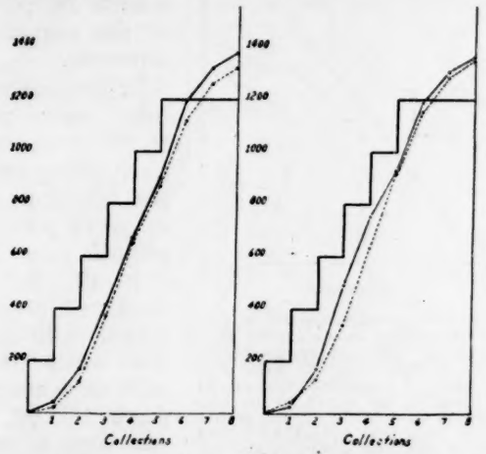

Chart 1.—The response of normal nonpregnant controls. The continuous curve on the left indicates the studied group; the broken curve, the assumed group. The continuous curve on the right indicates female subjects; the broken curve, male subjects.

Among the forty-one pregnant women studied there was a total of one hundred and twelve tests, seventy-eight of which were done ante partum and thirty-four post partum. For convenience of analysis, these tests have been grouped in four week periods dating both ways from the time of delivery. The numbers of tests in the four week periods of the earliest part of pregnancy are too few to give reliable data by groups. It is found, however, that taking all the tests done prior to the twelfth week ante partum, there are eleven, and the averaging of these tests shows a response of 1,389 cc., which is practically that of the control group. An average of eleven tests will establish a trend, and although larger numbers may change the average to some extent we feel that the performance of this group

will, even with larger numbers, not fall below the nonpregnant standards. These data as well as those of the other groups of normal pregnancy, both ante partum and post partum, are shown in table 2 and charts 2 and 3.

In the period from the twelfth to the ninth week ante partum, inclusive, the number of tests is nine. Here the average response fell below the normal level, the volume being 1,043 cc. This represents 78 per cent of the normal performance.

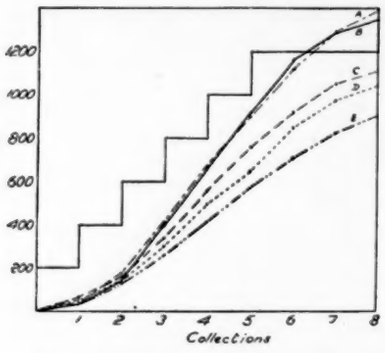

Chart 2.—The average response of normal pregnant patients in the various antepartum groups. Curve *A* represents the thirty-sixth to the thirteenth week ante partum; curve *B*, combined nonpregnant control; curve *C*, the eighth to the fifth week ante partum; curve *D*, the twelfth to the ninth week ante partum, and curve *E*, the fourth week ante partum to delivery.

In the succeeding four week period, there are twenty tests, giving an average output of 1,110 cc., or 82 per cent of normal.

In the last four weeks of pregnancy a total of thirty-eight tests was performed, with an average output of 905 cc., or 67 per cent of normal responses.

All these patients with one exception were clinically normal at all times as regards blood pressure, albuminuria, edema and other toxic signs, or so nearly so as to require no treatment. By that we mean that the urine showed no more than a slight trace of albumin, edema if present was limited to the feet and ankles during the afternoon and evening, and the systolic blood pressure was not more than from 120 to 130. The exception noted was a patient who had been on a limited diet for some days for mild toxic symptoms. This patient had responded well, and at the time of the test had no albumin in the urine and a systolic blood pressure of 116.

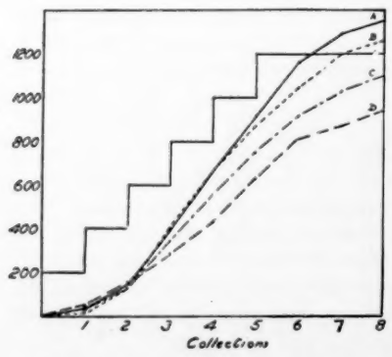

Chart 3.—The response of normal pregnant patients in the several postpartum groups. Curve *A* represents the combined nonpregnant control; curve *B*, from the ninth week post partum on; curve *C*, the fifth to eighth week post partum, and curve *D*, from delivery to the fourth week post partum.

In the first four weeks following delivery seventeen tests were made, with an average output of 940 cc. This shows a slight recovery from the four weeks immediately preceding delivery, but is only 70 per cent of the normal response. In this group also was one patient who was not normal throughout pregnancy. Her first test was done about two weeks ante partum, up to which time she had been normal. For several days before delivery she showed mild toxic symptoms which were easily controlled by diet, forced fluids and catharsis, but at the time of this test she was normal.

In the succeeding four weeks the response was better, 1,099 cc., or 81 per cent in the average of twelve patients.

In the last group of the postpartum series there were only five tests. They ranged in time from nine to twenty-one weeks post partum, and the average response was 1,259 cc., or 92 per cent of normal.

The last group of responses we wish to show comprises those of the patients with toxemia. There are only six tests reported in this group, and they were made, in a sense, in selected cases, in that the patients had all been in the wards and under the personal supervision of one of us (J. C. J.). Other cases that have been studied in the course of the work on toxemia have not been analyzed, and neither of us is familiar with them from the clinical point of view. These six tests were done on five patients who were severely toxic. The one on whom two tests were made was in bed for some weeks before the period of viability. She had high blood pressure, a high uric acid content of the blood, albuminuria, edema and headaches. A second patient was in the hospital under treatment for two weeks, having had a total of three convulsions. She showed all of the cardinal symptoms of eclampsia. Delivery was refused for two weeks on religious grounds, although it was finally consented to. The three remaining patients showed hypertension, albuminuria and other signs and symptoms of acute toxemia of pregnancy, one of them being particularly interesting because the toxemia occurred in connection with a hydatid mole in a patient from three and a half to four months along, according to dates. The performance in this group was in striking contrast to that in the clinically normal subjects. The average output was 225 cc., or 17 per cent of normal. These data appear in graphic form in table 2 and chart 4.

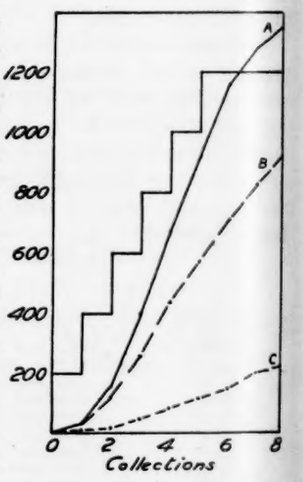

Chart 4.—The average performance of the normal nonpregnant controls (curve *A*), the normal pregnant patients in the last four weeks of pregnancy (curve *B*) and the toxemic patients (curve *C*).

Chart 5 gives the curves of individual patients, showing that the subjects actually conform to the averages given. They comprise all the patients, four, so far studied, who have had four tests done during the course of a pregnancy and one post partum. These patients were all normal throughout their pregnancies as regards toxemic symptoms. One toxic patient had five tests, and her curves are also shown. She is the patient who had three convulsions.

Chart 6 shows the two responses of a single subject, a volunteer, to a water drinking test, respectively, under normal conditions and during the rising stage of an artificial fever. The fever was induced by the intravenous injection of typhoid vaccine. This test cannot be directly compared with the foregoing ones because of the differences in the dosage of water used and the duration of the test. The important point is the definite cut in elimination, over 50 per cent, which resulted from the fever. The physiologic basis for it was worked out as long ago as 1883 by Mendelson,[5] who showed by oncometer experiments that there is a diminished circulation of blood through the kidney during fever and at the same time a diminution in the volume of urine. Fremont-Smith and his co-workers recently reported a similar oliguria among paretic patients into

5. Mendelson, W.: On the Renal Circulation During Fever, Am. J. M. Sc. **86**: 380, 1883.

whom malaria and sodoku were inoculated for therapeutic purposes.[6] The significance of this will be touched on later.

For the sake of completeness the determinations of the chloride and urea nitrogen are presented in table 3. They show no close correspondence to the water curves, nor should we expect them to do so, as the test is a test of the water capacity of the kidney. There is one point of interest and that is the remarkable uniformity of the nitrogen output throughout pregnancy in the face of a variation in volume of 30 per cent. This bears out the findings of Addis and Drury.[7] The low values in the toxemic group are probably due to dietary restriction.

Although a great deal of study has been devoted to pregnancy and its complications, little account has been taken of the duration of pregnancy except in relation to disease conditions. It has long been recognized that pregnancy subjects already damaged organs to a strain that may permanently add to the already existing damage. However, we were never taught that if a woman started pregnancy with normal kidneys and had a normal pregnancy her kidney function would not be as good at the end as at the beginning. Yet the foregoing experiments demonstrate that clinically "normal" organs, in the case of the kidneys at least, under properly designated tests will show the progressive strain of pregnancy.

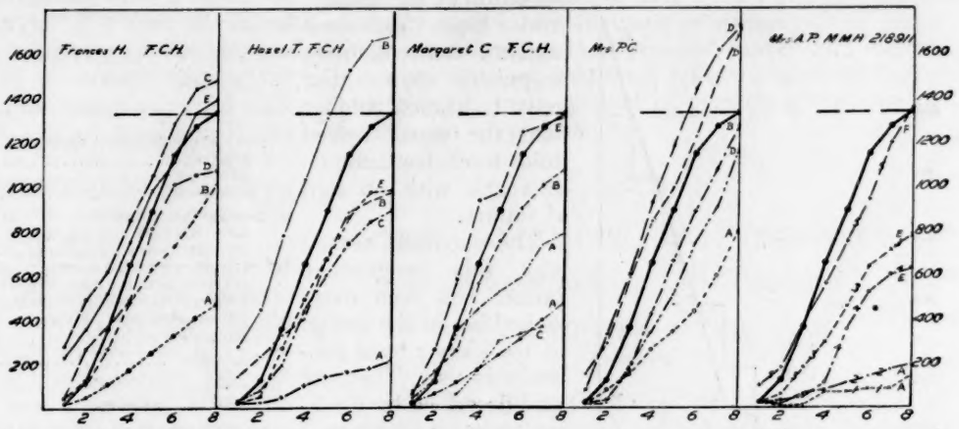

Chart 5.—The individual curves of all subjects in the series who have had four antepartum tests and one postpartum test. Curve *A* indicates from none to the fourth week ante partum; curve *B*, the fifth to the eighth week ante partum; curve *C*, the ninth to the twelfth week ante partum; curve *D*, thirteen weeks or more ante partum; curve *E*, from none to the fourth week post partum; curve *F*, sixteen weeks post partum.

TABLE 3.—*Average Excretion of Chlorides and Urea Nitrogen for the Same Groups as in Table 2.*

	Chlorides			Urea Nitrogen		
	Output	Differential	Percentage of Normal	Output	Differential	Percentage of Normal
Controls, normal nonpregnant						
Studied	2.741	.....	...	1.984	.....	...
Assumed	1.832	.....	...	1.595	.....	...
Combined	2.360	.....	...	1.822	.....	...
Normal pregnancy						
36th-13th week ante partum	2.176	.....	100	1.222	.....	100
12th-9th week ante partum	1.702	—474	78	1.080	—142	89
8th-5th week ante partum	1.640	—536	75	1.080	—142	89
4th week ante partum, delivery	2.048	—128	94	0.954	—268	79
Delivery—4th week post partum	2.451	+275	113	0.997	—225	82
5th-8th week post partum	2.424	+248	111	1.026	—194	85
9th week post partum on	1.746	—430	80	1.060	—162	88
Toxemias	1.175	—1001	54	0.341	—881	28

In a careful search of the literature as far back as 1920 and a less extensive one prior to that, we found only two publications bearing on the lowering of kidney function in normal pregnancy. Sondern and Harvey,[8] in 1912, published a preliminary report on the lowering of kidney function in the "latter part of pregnancy" as shown by the appearance time and excretion percentages with the phenolsulphonphthalein test in eighteen clinically normal cases. As compared with their "normals," the average of the eighteen pregnant subjects showed a delay of 50 per cent in appearance time and a drop of 30 per cent in the total output in two hours. This work was apparently not followed up, for no further reference to it was found except Stander's[9] comment that "we have used this test routinely for several years and have reluctantly come to the conclusion that it is not of much use in chronic nephritis complicating pregnancy."

The only other work we have found that touches remotely on this subject is a paper by Crabtree[10] as late as November, 1931. He dealt almost entirely with the anatomic changes, such as hydro-ureter and hydronephrosis, which occur during normal pregnancy, but he touched on the functional side of the picture in two places, as follows:

> From the urological point of view, the worst thing that can happen to the upper ureters and kidneys is for a woman to have a child a year for four or five years, because the atony produced by one pregnancy has been unable to return to normal before the intervention of a second pregnancy. These are the cases in which the large hydronephroses occur. The answer is prolonged vacation from child-bearing because, even though they return more slowly, a kidney of this type will return to normal.

Although this statement is suggestive of functional depression, Crabtree later touched on the functional aspects of the problem, only to minimize their importance. He said:

> Functionally, these kidneys differ from the kidneys of normal people very little indeed; they have normal phthalein, non-protein nitrogen and blood chemistry. The reason is that these cases are only temporary back pressures, of short duration. Extend that same degree of back pressure over a period of time greater than 4-5 months and you would then expect depressed function and the other changes which would come in the prostatic type of case or in the hydronephrotic type of case.

It is not quite clear from the latter quotation whether he applies this to all of the conditions of the kidney he discussed or only to the last one.

6. Fremont-Smith, F.; Morrison, L. R., and Makepeace, A. W.: Capillary Blood Flow in Man During Fever, J. Clin. Investigation **7**: 489, 1929.

7. Addis, T., and Drury, D. R.: The Rate of Urea Excretion: VIII, Effect of Changes in Urine Volume on Rate of Urea Excretion, J. Biol. Chem. **55**: 639 (April) 1923.

8. Sondern, F. E., and Harvey, T. W., Jr.: The Phenolsulphonephthalein Test for Estimating Renal Function in Pregnancy, Bull. Lying-In Hosp. **8**: 172, 1911-1912.

9. Stander, H. J.: The Toxemias of Pregnancy, Baltimore, Williams & Wilkins Company, 1929.

10. Crabtree, E. G.: Changes in the Urinary Tract in Women: The Results of Normal Pregnancy, New England J. Med. **205**: 1048 (Nov. 26) 1931.

The reasons for overlooking this progressive functional loss lay in two directions. In the first place the normal kidney has such an enormous reserve that its functional capacity may diminish decidedly without the loss being clinically evident. Whereas the normal volume of urine averages about 1,500 cc. daily, it is known that fluids may be forced to an output of 3,000 cc. daily for long periods without any sign of decompensation of the kidney. And from untreated patients with diabetes insipidus, the output may be much higher than the usual forced fluid level for months or years, with no sign of failure.

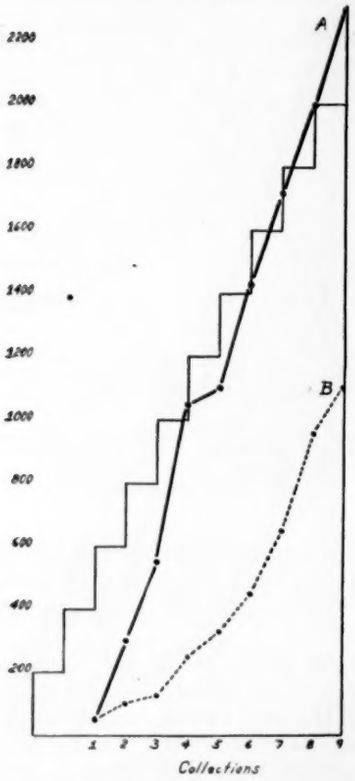

Chart 6.—The responses of a single subject to a similar test when in a normal condition (curve *A*) and when subjected to artificial fever (curve *B*).

The second reason why this progressive failure has been overlooked lies in the design of the kidney tests generally in use. They are well described by Cushny [11] and by Fishberg.[12] With two exceptions none of them are designed to show peak loads of kidney capacity, and consequently they commence to show lowered function only when the functional level gets down close to the point of decompensation. The possible exceptions to this statement are the urea clearance test of Van Slyke [13] and the creatinine test of Major.[14] The latter is a peak load test but has not been generally used in the obstetric case. The former is designed on a different principle altogether: the efficiency of kidney function by comparison of the urea contents of the blood and urine.

That the test we have used approximates a peak load is easily demonstrated by a calculation of the volume of urine of the largest half hour specimen in each test. If these volumes are averaged for the studied control group we find that the kidneys were putting out urine at an average of 362 cc. for this time interval. This means kidney work at the rate of 724 cc. per hour or over 11 liters for a sixteen hour day. Certainly such outputs as these come close to peak capacity. The averages for each group calculated on the largest half hour collection and the approximate sixteen hour total with percentage drop are shown in table 4. A scrutiny of these figures shows a drop in peak capacity as pregnancy progresses. The percentage loss curve, although at a different level, closely approximates the shape of the corresponding curve of percentage loss of volume. This is shown in chart 7.

Turning now to the data concerning the volumes, there are several points that deserve special comment. The first is the irregularity in the downward trend of the elimination curve as shown by the percentage output of 77.8 for the twelfth to the ninth week period ante partum and an output of 82.2 per cent for the succeeding four week period. The explanation of this is probably twofold. We found that at the Florence Crittenton Home many of the girls were nervous and apprehensive before taking their first test, owing to the tales told them by others who had taken the test previously. Many of these girls showed poorer elimina-

TABLE 4.—*Averages of Maximum Output per Half Hour Period for the Various Groups Studied and the Estimated Twenty-Four Hour Volume at This Rate*

	No.	Maximum Half Hour Output (Average), Cc.	Rate per Hour, Cc.	Approximate Rate per 16 Hour Day, Cc.	Percentage
Normal nonpregnant controls					
Studied	10	362	724	11,500	
Assumed	10	330	660	10,500	
Combined	20	346	692	11,100	100
Normal pregnancy					
36th-13th week ante partum	11	282	564	9,000	81
12th-9th week ante partum	9	228	456	7,300	66
8th-5th week ante partum	20	258	516	8,250	74
4th week ante partum, delivery	38	191	382	6,100	55
Delivery—4th week post partum	17	270	540	8,650	78
5th-8th week post partum	12	270	540	8,650	78
9th week post partum on	5	278	556	8,900	80
Toxemias	6	54	108	1,730	16

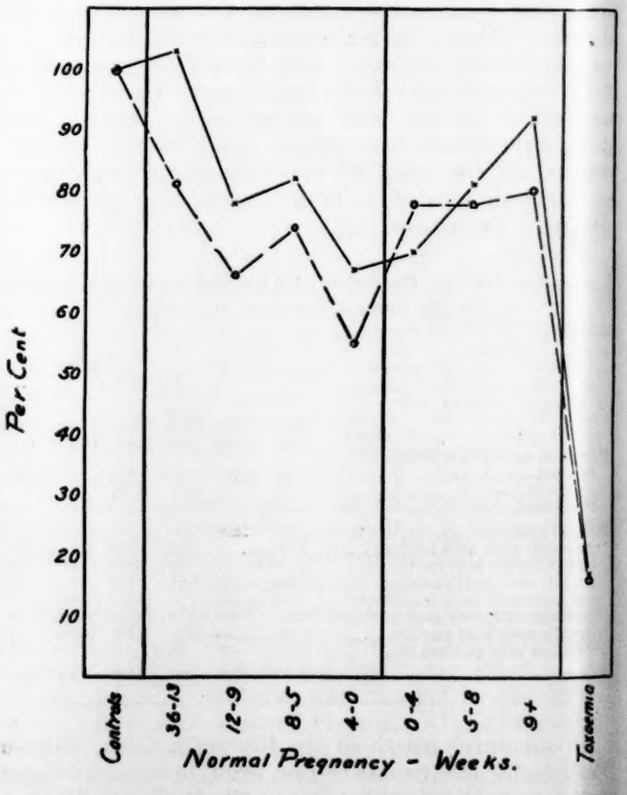

Chart 7.—Comparison of the percentage curves of the average total volume and of the average maximum half hour volume at different stages of pregnancy and in the toxemia of pregnancy. The continuous curve indicates the average total volume; the broken curve, the average maximum single collection. The curves from 36-13 to 4-0 are ante partum, and those from 0-4 to 9, post partum.

11. Cushny, A. R.: The Secretion of the Urine, London, Longmans, Green & Co., 1931.
12. Fishberg, A. M.: Hypertension and Nephritis, Philadelphia, Lea & Febiger, 1931.
13. Van Slyke, D. D.; Stillman, Edgar, and others: Observations on the Courses of Different Types of Bright's Disease and on the Resultant Changes in Renal Anatomy, Baltimore, Williams & Wilkins Company, 1930.
14. Major, R. H.: The Creatinin Test for Renal Function, Arch. Int. Med. **33**: 89 (Jan.) 1924.

tion at their first test than at their second, though the latter was several weeks later in pregnancy, and it was felt that the nervous element was largely responsible for the difference. The majority of the tests in the twelfth to the ninth week antepartum group (all but two of the nine, in fact) were first experiences. The other part of the explanation lies in the small number of tests involved.

The next point for comment lies in the effect of lactation on the postpartum tests. We have no actual figures on this, but the great majority of the patients were nursing their babies. If we should assume the diversion of 50 cc. of water to the manufacture of milk during the four hours of the test, it would shift the whole postpartum series closer to the normal figures, but would change their relative volumes but little among themselves or in relation to the antepartum series. The actual shift would be about 3 or 4 per cent.

We have not analyzed these cases from the point of view of parity, for the great majority of the subjects studied were primiparas. We think that this should be done when a sufficiently large number of tests has been secured to warrant it. Other studies now in progress show that posture has a decided effect on the volume of urine, probably through circulatory factors. It is possible that the differences in intra-abdominal pressure between primiparity and multiparity and the consequent circulatory differences will result in a different average level for the two groups.

There is a practical consideration which springs directly from the results of these observations and that is that every pregnant woman definitely drops toward the toxemic level of urine volume during the latter part of her pregnancy. This, of course, does not go so far as a decompensation except in the case that becomes clinically toxic. It does suggest that the kidney reserve is always sapped to a greater or lesser degree and that a supposedly insignificant happening might be the exciting cause of a clinical explosion.

The influence of intercurrent disease has received a great deal of attention in its relation to the causation of eclampsia, and the ideas regarding it have been well summarized by Stander.[9] These views have been largely based on emperical observation, but there is a more definitely demonstrable foundation for these beliefs when we consider the depressing influence of fever on urine volume. On the basis of the results presented, it can be seen that a febrile condition in the latter weeks of pregnancy may easily reduce the output to a level consistent with a severe toxemia. If we suppose that eclampsia and its allied states result from a circulating toxic substance, such a reduction in elimination might raise its concentration to a blood level which would bring about a clinical toxemia.

The title "Kidney Function in Normal Pregnancy" is taken for want of sufficient knowledge to coin a better. There are so many factors which play important parts in water metabolism that with the data at hand we cannot say that we are dealing with a change in kidney function per se rather than a change in water transportation to the kidney by reason of an alteration in the colloid properties of the blood or the osmotic relationships of the cells. We must, perforce, call it kidney function, for the time being, at least, until we can classify the underlying factors more carefully.

CONCLUSIONS

We have presented the results of a test designed to show the peak capacity of the kidney to handle water and have shown that this capacity declines progressively among clinically normal pregnant women in the last twelve weeks of pregnancy. It has already been shown by others that fever reduces the volume of urine, and the conjunction of intercurrent disease with this lowered functional capacity of the kidney in the latter weeks of pregnancy has been discussed as a precipitating factor in toxemic states. The results of this test in a small group of toxemic patients have been reported, and the clinically well known urinary retention, which occurs in this condition, has been demonstrated by this method. The work is being continued with the hope of finding some reliable, early method of predicting the onset of the toxemia of pregnancy.

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THE TOXEMIAS OF PREGNANCY

I. SOME OBSERVATIONS ON THE HEPATIC FACTOR

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Under the general caption of the "toxemias of pregnancy" are grouped a variety of functional derangements and organic changes defining a series of pathologic entities not necessarily interrelated but all interfering gravely or completely with the normal course of gestation.

With the diversity of the several better defined conditions included in this group, no common etiologic background can be assumed or demonstrated, and yet they do have in common the fundamental factor of the pregnancy. The improvement demonstrated in the surviving patient at termination of gestation further emphasizes this fact. The betterment ranges from apparent complete recovery in those cases in which no irreversible organic change has taken place to real amelioration of the more distressing features in the graver conditions where irreparable damage has been done. Further, in the course of even rigorously normal pregnancy there are not lacking evidences of lowered or modified function levels which may be interpreted as the response of the organism to the physiologic overload and to the myriad readjustments entailed by the gestational mechanism. In certain types of toxemia significant differences from normal pregnancy are those of degree rather than of kind, a measure, as it were, of the variable response of the homeostatic capacity of individual organisms to a common stimulus. Other types evidence the development of a true morbidity never to be recognized in the course of normal gestation. In this heterogeneous assembly the sole point they all present in common is that phase of the reproductive cycle transpiring from impregnation to delivery.

Selecting this sole common factor as the starting point, I initiated an investigation about twelve years ago in the hope of eliciting some further information concerning the underlying causes that transform what biologically should be the most normal of physiologic processes into conditions of grave hazard and morbidity to mother and child alike. The first phase dealt with the clinical and laboratory study of a series of women throughout pregnancies that conformed in all details

From the Evans Memorial of the Massachusetts Memorial Hospitals.
Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 11, 1932.

to the conventional standards of normality. Certain results of these studies have already appeared in the literature [1] and along certain lines offer criteria both for the estimation of normal performance and the recognition and evaluation of departures from them, the latter constituting significant and potentially informative abnormalities.

The second phase, of which this is a preliminary report on one small aspect of the problem, has been in active prosecution for the past two years in collaboration with a group of associates. The general procedure of study may be briefly outlined. Patients presenting any of the types of toxemia are admitted to the Robinson Memorial and placed under the personal care of some member of the investigative group. As complete a clinical and laboratory program is carried out as the condition of the patient permits, and after delivery the entire research program is repeated. If the toxemia occurs early in the pregnancy and the condition yields to palliative therapeutic measures, opportunity may occur for repetition of certain more significant tests and observations before the termination of the pregnancy. Further, in individual cases a final program of study may be carried through from six to twelve months after confinement. In the present short series the records of forty fairly completely studied cases are reviewed. The duration of the pregnancy at the time of the first contact shows one patient each of one, two and six months' pregnancy; two with three months'; four with four and five months'; seven with nine months' and thus approaching term; eight patients with seven months', and twelve with eight months' pregnancy. The average duration for the group is practically seven months.

As the present thesis deals with certain aspects of the hepatic factor, the data from two control series will be collated with those from the toxic group. The first of these is a group of one hundred normal pregnant women, over half of whom were studied at frequent intervals throughout pregnancy. The second is a consecutive series of forty patients presenting primary hepatic dysfunction without significant complication. The composition of the groups and certain significant general records are collected in table 1.

TABLE 1.—*Composition of Groups*

Data		Pregnant: Normal	Pregnant: Toxic	Not Pregnant, Hepatic
Number		100	40	40
Age	High	40	44	45
	Low	13	18	19
	Average	24	30	32
Parity	High	10	12	6
	Low	1	1	0
	Average	1.9	3.7	1.8*
Pregnancies	Total	192	149	73
	Toxic	20†	64‡	15§

* Twelve of these patients had never conceived; a number had practiced contraception. The average parity for fertile matings was 2.6

† There were sixteen miscarriages and four therapeutic abortions.

‡ One ruptured tubal pregnancy is included.

§ Fourteen miscarriages and one ruptured tubal pregnancy are included.

The first group was composed of patients from the Robinson and Evans Memorial Hospitals, the House of Mercy and the Talitha Cumi Home; the second, from the diagnostic service of the Evans Memorial Hospital. All the patients were studied in connection with other investigations of the author and his associates at the last named institution.

1. Rowe, A. W.; Gallivan, D. E., and Matthews, H.: Am. J. Physiol. **95**: 592 (Dec.) 1930; **96**: 94, 101 and 112 (Jan.) 1931; Proc. Soc. Exper. Biol. & Med. **28**: 664 (March) 1931. Rowe, A. W.: Am. J. Obst. & Gynec. **21**: 644 (May) 1931.

But little additional comment is necessary. The group with hepatic conditions is composed of married women falling within the same age limits as those in the toxic group. Many of the normal pregnant group were primiparas, a condition intrinsic in their institutional origin. In addition to the current toxemias of the study group, twenty-three earlier toxic pregnancies and one ruptured tubal pregnancy were recorded. The incidence of these is shown in graphic form.

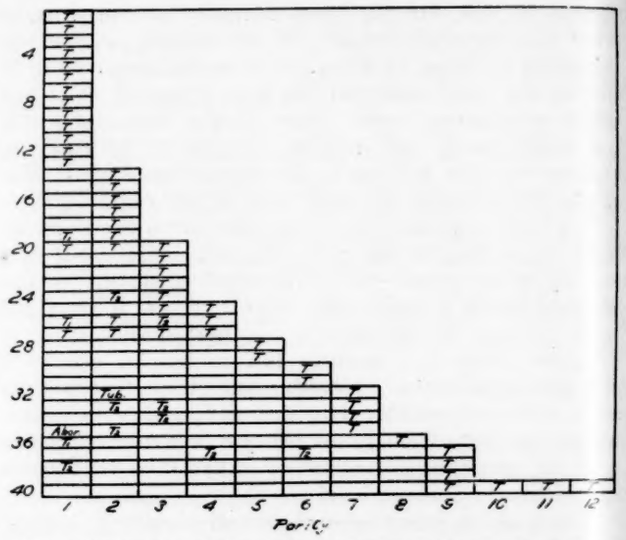

Chart showing the incidence of complication in forty pregnant women with hepatic dysfunction. *T* indicates toxemia, 50; T_1, toxemia with stillbirth, 3; T_2, toxemia with miscarriage, 9; *Tub*, ectopic tubal pregnancy, and *Abor.*, abortion (therapeutic), 1.

As was noted in a foregoing paragraph, the investigative program was highly detailed, and the collation of the available data established certain etiologic trends. These in turn allowed the subdivision of the toxic series into four groups based on the probable incidence of hepatic and renal factors (table 2).

Only seven patients of the whole series failed to show an established or probable hepatic element, while in over 50 per cent a significant renal complication was not demonstrated. The diagnoses recorded on admission show a definite lack of correlation with these figures. Simple "toxemia" was reported for fourteen patients and eclampsia or preeclampsia for four others. A group of twenty-six patients were recorded as having cardiorenal dysfunction, with one or more of the following symptoms: hypertension, renal and cardiac disorders and edema. One patient was recorded as having an hepatic condition, while six were classed as patients with pernicious vomiting (table 3). The obstetric history shows the delivery of eight dead children after periods of gestation ranging from three months to term, and an equal number who were born alive but who subsequently died. Naturally prematurity played an important part in the mortality, 50 per cent of the total group actually coming to delivery at term, one half from spontaneous, the other from induced labor. Seven of the children survived, six were born dead, and seven died subsequently to birth, prematurity thus accounting for all but one child's death in this last group. There was one maternal death in the series. The data from the maternal histories and physical examination were not strikingly suggestive. Four of the mothers had had typhoid, one malaria, and two operations on the gallbladder. Focal infection was fairly frequently recorded but no more frequently, cer-

tainly, than it would have been in an equivalent non-hepatic series.

The purposes of the present thesis can best be served by consideration of a selection of the more pertinent data in comparison with those deriving from the two control groups, one of which was composed of normal pregnant women without evidence of hepatic involvement, the other of patients with conditions of the liver uncomplicated by pregnancy. Attention may first be turned to the incidence of certain symptoms of which hepatic dysfunction is one frequent cause (table 4).

Abnormalities of the eye, such as blurring, spots, photophobia and the like, are three times as common in the toxic and hepatic groups of patients as in those with uncomplicated pregnancy, while headache and vertigo with greater absolute frequency are reported only twice as often because of the larger number of the normal pregnant group complaining of these conditions. Nausea and vomiting, significant in all the patients, show the greatest incidence in the toxic group, suggesting a summation effect of the two causes. Fatigability and pain (gastric and abdominal) are high-

TABLE 2.—*Composition of Toxic Group*

	Group I	Group II	Group III	Group IV
Liver	+	+	?	0
Kidneys	0	+	0	+
Number	10	10	13	7
Percentage	25	25	32.5	17.5

TABLE 3.—*Obstetric History*

Delivery	Child			
	Surviving	Dead	Died Later*	Total
Normal	15	4	3	22
Induced	9	4	5	18
Totals	24	8	8	40

* Death occurred within from five hours to twenty-eight days after birth. The average survival was nine days.

est in the liver group with hepatic conditions and lowest in the normal pregnant series. Flatulence and constipation characterize one third of the two pregnant groups and are reported twice as often by the patients with disorders of the liver. The occurrence of an earlier jaundice is practically at a uniform level throughout the entire group. A liver factor can be traced in many of these, but the emphasis is a highly variable one.

The catamenia constitute a function subversively influenced by a number of apparently unrelated conditions. The basic data appear in table 5. The age of onset is included for completeness; it carries no direct connotation in regard to the present question.

The records in table 5 for the two pregnant series naturally antedate the time of study. Suggested influences here must be regarded either as residua of earlier conditions or evidences of an incipient morbidity developing to significant proportions under the stress of gestation. A possible hepatic influence may be traced in the production of irregularity with increased interval, and even more strikingly in the seeming causation of scanty flow. Such analysis and attribution necessitate the assumption that other causal agents than the liver are represented equally in the three groups.

With the generally recognized characteristic influence of pregnancy on the protein metabolism and of the liver on certain of the intermediate steps, the examination of the urine for the nitrogenous end-products offers a significant approach.

The report of glycosuria is included in table 6 for the sake of convenience and will be discussed later. The total nitrogen figures are highest in normal pregnancy, in spite of the fact that there is a significant

TABLE 4.—*Symptoms*

Data	Pregnant		Not Pregnant, Hepatic, per Cent
	Normal, per Cent	Toxic, per Cent	
Eye	17	50	50
Headache	42	78	78
Vertigo	31	60	55
Fatigue	53	68	85
Nausea	44	65	48
Vomiting	28	50	35
Pain	11	23	35
Flatulence	39	33	73
Constipation	31	33	68
Jaundice	8	8	10

positive nitrogen balance in this condition over and above the fetal needs. The liver average without these two influences is somewhat lower, while the toxic group shows a further significant decrement to a level probably below the level conventionally reported as that of maintenance.[2] Patently, one important factor influencing this datum is the effect of the three conditions on appetite. In my opinion this is the largest single factor in the low nitrogen output of the toxic pregnant woman. The normal ammonia values shown throughout preclude the presence of a significant ketosis in any of the groups. The low alveolar carbon dioxide so frequently found in normal pregnancy is not traceable to a significant acidosis. In the patients with renal complications an acidotic influence would more probably derive from retention, a condition without effect on the output of ammonia. It will be remembered that but six patients of the toxic group were designated as having cases of "pernicious vomiting." Ketosis, then, plays but a small part in the present series.

High residual nitrogen is a general evidence of disturbed metabolism deriving from many causes. While the average values in both the normal and the hepatic

TABLE 5.—*Catamenia*

Data	Pregnant		Not Pregnant, Hepatic, per Cent
	Normal,* per Cent	Toxic, per Cent	
Onset			
Before 12 years	5.5	2.5	15.0
From 12 to 14 years	75.1	75.0	67.5
After 14 years	18.4	22.5	17.5
Interval			
Regular	88.0	82.5	75.0
Irregular, increased	8.8	12.5	20.0
decreased	3.2	5.0	5.0
Period			
Scanty	9.1	20.0	25.0
Normal	75.8	62.5	57.5
Profuse	15.1	17.5	17.5

* Drawn from a larger group (250) of normal pregnant women.

series are below the conventional upper limit of 9 per cent, practically two in every five patients exceed this somewhat liberal boundary. The figures for the toxic group leave no doubt as to the profound disturbance of metabolism engendered by the primary condition. Two thirds of the patients are above the normal limit, and the average value exceeds significantly both the con-

2. Sherman, H. C.: Chemistry of Food and Nutrition, ed 3, New York, Macmillan Company, 1926, p. 247.

ventional norm and the values of the other groups. The liver factor here could be regarded as the superimposed effect.

As the source of the constituents of the urine, the chemical composition of the blood next comes to consideration.

Low levels of nonprotein and urea nitrogen characterize normal pregnancy; the values in toxemia, while absolutely normal, are relatively much increased.

TABLE 6.—*Urine Measurements*

Data	Pregnant		Not Pregnant, Hepatic
	Normal	Toxic	
Glycosuria	34%*	20%	25%
Total nitrogen (Gm.)	8.22	6.60	7.61
Ammonia nitrogen (per cent)	4.9	4.5	4.0
Residual nitrogen (per cent)	7.9	10.5	8.6
Percentage > 9 per cent	39	68	43

* After repeated tests on the patient, 18 per cent show consistent glycosuria.

TABLE 7.—*Blood Chemistry*

Data	Pregnant		Not Pregnant, Hepatic
	Normal	Toxic	
Nonprotein nitrogen	25	31	30
Urea nitrogen	12	15	14
Uric acid	3.3	3.8	3.2
Residual nitrogen	11.3	14.1	14.3
Cholesterol	177	187	..
Sugar	84	85	90

In the patients with liver disorders who are free from the depressing influence of pregnancy, normal values prevail. This is one instance in which the relative levels are more significant than the absolute; the suggested rise in toxemia is confirmed by the high uric acid value. A renal element could be responsible for the first two, but the relative and absolute increase in blood uric acid is more suggestive of the hepatic influence at the other nitrogen levels here recorded. This statement is made with special recognition of the selective nature of increments pointed out by Chace and Myers.[3] The higher residual nitrogen in both the toxic groups reflects that general condition. Parenthetically, there is no inconsistency in the differences in the blood and urine pictures for this constituent; the blood is a channel of egress for wastes, and the levels are merely indexes of the speed of mobilization and transport as regulated by tissue content and kidney permeability. The urine, on the other hand, is collected material practically outside of the body except in a geographic sense, the end-result of an irreversible operation. Slower elimination of the constituents of the undetermined fraction in patients with hepatic conditions could maintain the same blood level as in toxemia and show much less in the urine. Further, in the present instance, at least, the relative figures for blood and urine suggest an improved renal permeability in the toxic group at least for this group of substances (0.693 Gm. as against 0.654 Gm. with a lower protein level).

The blood morphology, the significant data of which are in table 8, exhibits a somewhat different balance between the two influences. The erythrocyte level and the high leukocyte count reflect the pregnancy, while the eosinophil increment suggests the liver. As hepatic dysfunction is associated with secondary anemia, it is hard at first sight to explain the relatively high hemoglobin in the toxic group. Partial dehydration, with lowered blood volume, could explain the relative increase but would necessitate a more profound depression of hematopoiesis in toxemia through the agency of the liver. A longer series of cases is needed to determine with certainty the authority of the reported numerical values.

Both pregnancy and hepatic dysfunction[4] have a profound influence on sugar metabolism, especially as indicated by the tolerance for galactose.[5] The glycosuria as an evidence of disturbed carbohydrate metabolism has already been recorded in table 6. Toxic pregnancies seemingly exercise little, if any, more depressing influence on sugar utilization, as shown by glycosuria, than do those following a normal course.

The galactose data are given in table 9. In presenting the data the records of the four subgroups are considered separately, in order that any liver influence may be more readily ascertained. For the nonpregnant hepatic group, 40 Gm. represents the normal level, while during the course of pregnancy, 30 Gm. and later 20 Gm. are the levels to be regarded as normal. A lowering of from 30 to 20 by an hepatic factor is masked by this fact and the further fact that there is no uniform stadium during pregnancy for the transition from the higher to the lower level. With this limitation coupled to a second, i. e., that lowered renal permeability may raise the apparent tolerance level, the results may be analyzed. In subgroup I, in which only a liver element is recognized, two patients show a real depression and one a level above prediction. In group II, with both renal and hepatic factors, two more show depression. In group III, in which the hepatic factor is putative and lacks final documentation, five are below

TABLE 8.—*Blood Morphology*

Data	Pregnant		Not Pregnant, Hepatic
	Normal	Toxic	
Hemoglobin	67%	78%	81%
Erythrocytes (millions)	4.15	4.11	4.55
Color index	0.81	0.95	0.89
Leukocytes (thousands)	9.6	10.6	7.6
Lymphocytes	25%	27%	32%
Eosinophils	1%	2%	3%

TABLE 9.—*Galactose Tolerance*

	Group				
	I	II	III	IV	Hepatic
Liver	+	+	?	0	+
Kidney	0	+	0	+	0
Over 40 Gm.	0	0	1	0	1
40 Gm.	1	0	3	0	2 (Normal)
Normal for pregnancy (30 Gm.	2	2	0	3	4
Normal for pregnancy (20 Gm.	4	4	2	3	18
10 Gm.	2	2	5	0	15

prediction, and four are above. Finally, in group IV, the uncomplicated renal group, all the patients are normal. The test was not completed on the six patients omitted from the table. The general downward shift influenced by hepatic dysfunction is clearly recorded in the last column. Even here it will be noted that two patients are normal and one actually above prediction. In the paper already cited,[4] 4 per cent of a series of one hundred and sixty-eight patients with proved dys-

3. Chace, A. F., and Myers, V. C.: The Value of Recent Laboratory Tests in the Diagnosis and Treatment of Nephritis, J. A. M. A. **67**: 929 (Sept. 23) 1916.

4. Rowe, A. W., and McManus, M.: Am. J. M. Sc. **181**: 777 (June) 1931.

5. Rowe, A. W.: Sugar Tolerance as an Aid to Diagnosis, J. A. M. A. **89**: 1403 (Oct. 22) 1927.

function of the liver showed normal, and another 4 per cent increased, tolerance levels. The reasons for this are unknown, although several plausible explanations might be offered. In the present instance it is the frequency of appearance of the anomaly in the toxic group that calls for comment. Five in thirty-four patients, or 15 per cent,[6] show an assimilation limit that is above prediction. Whatever may be the mechanism that occasionally produces a high tolerance in an uncomplicated hepatic condition, it would seem to be of more frequent occurrence in the toxemias of pregnancy in which the liver has been suggested or proved to be involved. Analysis of the apparently normal patients is not significant, as noted earlier. Their number, however, undoubtedly exceeds materially the incidence in uncomplicated hepatopathy.

TABLE 10.—*Blood Pressures*

Group	Normal Pregnant	Toxic Pregnant I	Toxic Pregnant II	Toxic Pregnant III	Toxic Pregnant IV	Not Pregnant, Hepatic
Systolic	108	150	169	145	159	107
Diastolic	66	88	105	89	105	64

The effect of the liver and of the kidney on the levels of blood pressure is given in table 10. The renal influence on the diastolic pressure is unmistakable. The hypertension that characterizes most of the toxemias of pregnancy seems to derive from a mechanism more complex than the simple renal formulation.

In the preceding discussion much has been said about the functional level of the liver. Naturally, in order to reach reliable ground for such an opinion, numerous lines of approach must be canvassed, and their conjoint records offer the warrant for the diagnosis. Among these one technic stands out of peculiar value, as the approach is factual and the several steps that compose the method have been carefully and adequately tested and controlled. The duodenal test of McClure,[7] based on collecting the contents of this portion of the intestine by the Rehfuss[8] tube and then quantitating the several constituents by a series of precise microchemical methods, has yielded results of a most informative character. The data from these studies have been collected in table 11.

Only the tests giving positive evidence of hepatic dysfunction have been compiled, as the inclusion of normal data from the nonhepatic cases would serve only to dilute the records and lead to misleading magnitudes. As intubation in a number of patients could not be done, for one reason or another, the record is incomplete, and certain of the probable hepatic cases (group III) lack this final evidence, which would establish their hepatic status. Inspection of the data from the toxemia group in comparison with those from the control liver series leaves no doubt as to the evidence of grave hepatic disorder in the patients comprising the former group. Cholesterol seems to be the one constituent not markedly lowered. A possible explanation may lie in the high blood cholesterol, which is a characteristic feature of pregnancy, and which may imply a higher level to the cholesterol metabolism in this condition. Whatever may be the level of the individual constituent, the analysis of each sample has yielded clearcut evidence of a depressed hepatic function.

6. It would be 18 per cent if the patients with uncomplicated renal conditions were deleted.

7. McClure, C. W., and Vance, E.: Boston M. & S. J. **192**: 431 and 433, 1925. McClure, C. W.; Huntsinger, M. E., and Montague, O. C.: Ibid. **193**: 1050, 1925. McClure, C. W.; Mendenhall, W. L., and Huntsinger, M. E.: Ibid. **193**: 1052, 1925. McClure, C. W.; Huntsinger, M. E., and Gottlieb, J.: Ibid. **193**: 1054, 1925. McClure, C. W., and Huntsinger, M. E.: Ibid. **194**: 812, 1926. McClure, C. W.; Cate, M., and Mendenhall, W. L.: Ibid. **195**: 76, 1926. McClure, C. W.; Mendenhall, W. L., and Huntsinger, Mildred E.: The Evaluation and Treatment of Disturbed Liver Function, J. A. M. A. **85**: 1537 (Nov. 14) 1925. McClure, C. W.: Am. J. M. Sc. **176**: 309, 1928.

8. Rehfuss, M. E.: Am. J. M. Sc. **147**: 848, 1914.

COMMENT

But scant reference has been made to the rather extensive literature in this field. In Stander's excellent monograph[9] the significant material up to 1929 is reviewed, the bibliography comprising about seven hundred titles. The present paper is the first of a series and is a brief statement of one phase of an extended investigation. The data here presented offer a documentation for the inclusion of an hepatic factor in a significant proportion of a small series of thoroughly studied cases. Such an influence in the eclamptic case was recognized nearly one hundred and fifty years ago, and in recent decades the existence of "liver of pregnancy" has been actively supported and as actively denied. From the present data one may feel warranted in concluding that in a variety of toxic conditions associated with gestation, functional derangements of the liver are frequently a significant association. Equally, other toxemias fail to demonstrate an hepatic factor by a series of carefully selected objective methods of study. One speaks guardedly of "association," as the sequence of a causal-resultant relationship, if there is one, is not established. The term "toxemia" is, after all, no more than a convenient collective label for a rather wide scatter of conditions that have only gravidity as a single common point. More extended and detailed studies offer some hope of a better resolution of the underlying etiologic factors.

TABLE 11.—*Liver Function (McClure)*

Data	Toxic	Hepatic
Number	19	40
Color		
Green	0	10%
Yellow	84%	60%
Yellow-brown	11%	5%
Brown	5%	25%
Furfurol index (80)*		
Below normal	79%	90%
Average value	47	37
Cholesterol (30)*		
Below normal	37%	58%
Average value	36	30
Pigment I (8)*		
Below normal	84%	90%
Average value	4.0	2.6
Pigment II (7)*		
Below normal	89%	88%
Average value	3.9	3.6

* Lower normal limit.

SUMMARY

Certain laboratory and clinical findings arising from the study of forty women referred for toxic pregnancy have been compared with similar data from a series of normal pregnant women and also with a like group not pregnant but having well established hepatic dysfunction. Evidences of disturbed function of the liver are found in many, but not all, of the toxic series.

80 East Concord Street.

9. Stander, H. J.: The Toxemias of Pregnancy, Baltimore, Williams & Wilkins Company, 1929.

THE CONSERVATIVE TREATMENT OF ECLAMPSIA

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The data presented in this report are taken from the case records of ninety-one consecutive patients with eclamptic convulsions in the obstetric service of the Grady Hospital, Emory University Division, in Atlanta, over a period of four years and four months, beginning on Jan. 1, 1928, and ending on May 1, 1932. The purpose of this presentation is to emphasize again the better results obtained when a policy of conservative management is practiced almost exclusively and when there is little or no interference with the processes of labor. The Grady Hospital, municipally controlled and used as a teaching institution, is the haven of 120,000 Negroes of the city and adjacent territory. Many of these women are admitted after having had meager or no prenatal care. Others are brought in who have been under the care of a midwife at home in a trial labor, or have otherwise been neglected. Despite these handicaps, and owing to a firm and persistent policy of conservatism and noninterference adopted by the staff, favorable results are reported.

A systematic routine has been followed, with little variation. The management is, briefly, as follows: A patient entering the hospital in a state of convulsions is first given a hypodermic injection of morphine sulphate, ¼ grain (0.0162 Gm.). Then 20 cc. of 10 per cent magnesium sulphate is given intravenously and repeated every hour until convulsions are controlled or until four or five injections have been given. Often the magnesium sulphate is given intramuscularly after the first injection. Next, 300 cc. of 25 per cent dextrose in freshly distilled water is given intravenously. The dextrose solution is repeated every eight hours until after delivery or until full control of convulsions, and then every twelve hours for two days following delivery in severe cases. It is reasonable to assume that the magnesium sulphate quickly relieves the intracranial pressure by reducing the edema of the brain. In a large service where this drug is used extensively in preeclampsia as well as in eclampsia, we have observed no appreciable respiratory or circulatory embarrassment. By immediately following the intravenous injection of magnesium sulphate with concentrated dextrose solution and by repeating at regular periodic intervals, diuresis is readily established and maintained. It is also believed that dextrose prevents a recurrence of the cerebral edema, because once the convulsions have been controlled it has been rare that we have had to resort again to magnesium sulphate or to other sedatives. The morphine is not repeated except as indicated for relief in labor.

Labor is not induced until the convulsions are controlled and dehydration at least partially overcome. For the past three years we have induced labor by rupturing the membranes and allowing a large amount of the amniotic fluid to drain away. This is done by careful technic, the dangers of infection always being kept in mind. We believe that the larger the amount of amniotic fluid allowed to escape, the more quickly and surely will labor be established. So successful has this method been that a Vorhees bag or a catheter has not been used in the past eighteen months to induce labor. Occasionally one or two, 2 minim (0.12 cc.) doses of solution of pituitary have beeen given after rupture of the membranes when there has been a delay in the onset of labor.

A summary of data is given in table form:

		Per Cent
Number of patients	91	
Primiparas	67	73
Multiparas	24	26
Average age	20 yrs.	
Youngest	13 yrs.	
Oldest	42 yrs.	
Number aged 14 years	6	
Wassermann test of the blood positive	10	11
Wassermann test of the blood negative	79	87
Wassermann test of the blood not taken	2	2
Maternal deaths	5	5.4
Still-born babies	21	23.5
Neonatal deaths	11	
Neonatal and still-born babies	32	35.9
Premature babies (6 as early as the sixth month)	27	30
Blood sugar in 40 patients (average)	74.7 mg.	
Nonprotein nitrogen of blood in 40 patients (average)	29.4	
Albuminuria	99	
Number in whom fever developed (100.4 F. or above) twice while in hospital	58	63
Average length of labor (including longest labor, 77 hours)	19⅓ hrs.	
Deliveries by forceps	9	10
Cesarean sections, both classic (one on deformed pelvis)	2	2

It will be observed that only thirty-four were registered as prenatal patients. A large percentage of this number, however, did not receive anything approaching adequate prenatal care, since they never returned to the outpatient clinic for instructions after the initial visit.

Attention is directed to the fetal mortality rate of 35.9 per cent. This might have been lowered by more active intervention, but it would probably have been at the expense of maternal life. It is to be remembered that 30 per cent of all of these babies were premature. Williams [1] states that the expected fetal mortality rate in eclampsia is from 40 to 50 per cent. It is unquestionably true that one reason for the high maternal mortality rate in this country is the exaggerated importance of fetal life. With the high percentage of prematurity in eclampsia and the consequent uncertainty of the child's survival, the lack of wisdom of such a policy is obvious.

The average length of labor was nineteen and one-third hours, which is a little longer than the average time given in standard textbooks. Once a patient is in active labor, she is left alone. There is no intervention, except when there are positive indications. It will be observed in the accompanying table that no versions and extractions were done. Also that the forceps was used only nine times, an incidence of about 10 per cent. A mixture of opium alkaloids hydrochloride or morphine is given for relief of pains in labor, but nothing is done to hurry labor. One cesarean section was done for deformed pelvis in a postmature child. The other section was done in a primipara with high presenting part and with a rigid, elongated cervix. Both patients recovered.

In 40 patients who were examined for blood sugar, the average result was 74.7 mg. per one hundred cubic centimeters, which is well within normal range.

Inhalation ether anesthesia for labor by open drop method is used exclusively in our service. In patients with eclampsia this is given guardedly and only at the time for expulsion of the child's head. We believe with Stander [2] that anesthesia in eclampsia should be

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Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 12, 1932.

1. Williams, J. W.: Obstetrics, ed. 6, D. Appleton and Company, 1930, p. 671.
2. Stander, H. J.: Clinical and Experimental Studies in Eclampsia, Am. J. Obst. & Gynec. **13**: 5, 1927.

reduced to a minimum, and that patients in semicomatose or comatose states should receive no anesthesia at all. He has demonstrated by experiments on dogs that lesions of the liver in eclamptic women are practically identical with those found in the liver of these anesthetized animals. Also, and equally important, he has shown that the chemical changes in the blood in eclampsia, namely, the lowering of the carbon dioxide-combining power and the increase in lactic acid content, are the same as those found after anesthesia. It is apparent, therefore, that any anesthesia in eclampsia will superimpose additional lesions on the already damaged liver, as well as add an additional burden to the altered chemical composition of the blood.

A brief summary of the five maternal deaths is given.

CASE 1.—A septipara, aged 42, was admitted to the hospital at the seventh month of pregnancy. She was not in labor. Her blood pressure was 200 systolic and 140 diastolic, and the urine was heavy with albumin. Magnesium sulphate was given as a routine and a bag inserted in the cervix, although labor pains never developed; she died ten hours later, undelivered. This patient did not receive the intravenous dextrose solution, although no reason for its omission is given in the history. There was some doubt about the diagnosis of eclampsia in this case, as one member of the visiting staff believed that this woman died of uremia.

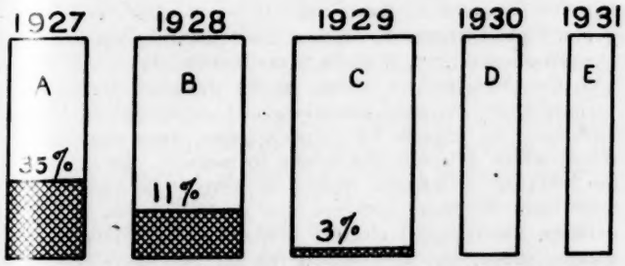

Diagram showing maternal mortality rates: *A*, there were seven deaths among the twenty patients; dextrose and magnesium sulphate were given to only six patients. *B*, there were three deaths among twenty-seven patients; dextrose and magnesium sulphate were given as a routine. *C*, there was one death among thirty patients; this death was caused by infection from a catheter introduced into the uterus before admission. *D*, there were no deaths among these fourteen patients. *E*, there were no deaths among these eleven patients.

CASE 2.—A septipara, aged 35, was admitted at the eighth month of pregnancy in a semicomatose state, having had several convulsions before entry. She was not in labor. Her blood pressure was 265 systolic and 140 diastolic, and the urine was heavy with albumin. Her heart action was irregular. Morphine, magnesium sulphate and a solution of dextrose were given as a routine measure. She died after ten and one-half hours, undelivered.

CASE 3.—A primipara, aged 16, was admitted at the eighth month of pregnancy, in labor. She delivered a macerated fetus after a slow, long labor. During labor a temperature of 102 F. and a pulse rate of 140 developed. She died fourteen hours after delivery. There was no autopsy.

CASE 4.—A primipara, age not stated, was admitted at the seventh month of pregnancy. Her blood pressure was 220 systolic and 140 diastolic, and the urine was heavy with albumin. Convulsions had developed at home; she had been treated by a midwife and a doctor. The patient had been infected by the insertion of a catheter in the uterus before admission. A macerated fetus was delivered spontaneously after normal labor. She died a week later of infection. The autopsy showed evidence of marked destruction of the kidney.

CASE 5.—A primipara, aged 18, was admitted at term, in labor. Her blood pressure was 160 systolic and 110 diastolic. The urine was heavy with albumin and showed much pus. Two convulsions occurred during the first stage of labor. The second stage was prolonged, and was terminated by low forceps. The patient died of colon bacillus infection on the fourteenth day. The cultures of the blood made on two different occasions were positive for colon bacilli. Autopsy revealed gangrene of the vaginal walls, mucosa of the bladder and of the ureters and multiple abscesses of both kidneys.

In a previous analysis of eclampsia in our service over a period of eight years we reported a gross maternal mortality of 21 per cent.[3] A well defined policy of conservative management was not practiced then as now. Neither were magnesium sulphate and dextrose given as a routine. The present policy and methods of treatment were begun about Jan. 1, 1928. The comparative maternal mortality rates before and after this date are illustrated by the accompanying chart.

CONCLUSION

From a study of the results obtained in a series of ninety-one consecutive cases of eclampsia, with a maternal mortality rate of 5.4 per cent, the following conclusions appear to be justified.

1. The best results are obtained by controlling the convulsions before any attempt is made to induce labor.

2. An initial dose of morphine sulphate, ¼ grain (0.0162 Gm.), should always be given; then 20 cc. of a 10 per cent magnesium sulphate solution intravenously, followed by intramuscular or intravenous injections at hourly intervals to control the convulsions.

3. Concentrated (25 per cent) dextrose solution intravenously in 300 cc. injections is given at eight hour intervals to assist in reducing cerebral edema and in maintaining blood volume, and also to stimulate diuresis. This must be continued for two days after labor, or, in severe types, after control of convulsions.

4. Labor is initiated by rupturing the membranes and allowing the amniotic fluid to escape. This method has been successful and has been the least disturbing to the patient.

5. A policy of nonintervention in labor is best for the mother. Opiates are given as needed to limit the pains.

6. Anesthesia should be limited as much as possible. Light ether anesthesia is perhaps the safest. No anesthetic should be administered to patients in a semicomatose or comatose state.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DR. JANNEY AND MISS WALKER, DR. ROWE AND DR. UPSHAW

DR. E. L. KING, New Orleans: Dr. Upshaw's paper emphasizes what all have learned by experience. Some years ago a review of the records from the Charity Hospital in this city showed that the maternal mortality by the method then in vogue, which consisted of delivery as soon as possible, generally by some operative type of delivery, was 39 per cent. Later an investigation of cesarean sections showed that in cases in this hospital the maternal mortality in eclampsia treatment by section was 33 per cent. Since then, conservative treatment has been the rule and it has been that if this is carefully and accurately followed out, the gross maternal mortality will vary between 7 and 10 per cent. At first when conservative treatment was begun, the Stroganoff method was used. In the past two years sodium amytal, combined with elimination and morphine, has been used. I will not go into details but will say that as a rule after the first intravenous injection of sodium amytal there is no further convulsion and the mortality has varied between 7 and 10 per cent. My associates and I do not feel that the fetal mortality is increased by conservatism; in fact, we feel that, if anything, it is decreased. Certainly our

3. Upshaw, C. B.: Management of Eclampsia in the Negro Race, South. M. J. 23: 5, 1930.

experience has been that, in the majority of cases in which there is a viable baby in the uterus at the time of admission, a living child is delivered. We do not hurry the delivery. We disregard the pregnancy temporarily, treat the patient until the acute convulsive stage is over, and then induce labor later on, generally by the rupture of the membranes, reinforced by castor oil and quinine. I would emphasize the disadvantages of general anesthesia for eclampsia, particularly ether. I should like to ask Dr. Janney one or two questions: Did the percentage of urinary reduction correspond to the clinical severity of the toxemia? Is it his opinion that the intravenous use of dextrose is of benefit by producing better elimination? I should like to ask Dr. Rowe whether he has used the bromsulphalein test in toxemias of pregnancy, which seems to give definite evidence of liver damage and in my experience gives evidence of liver damage corresponding pretty well with the clinical picture of the patient. When working with that, we noticed that the Rosenthal test showed retention in eclampsia and preeclampsia, while the van den Bergh was normal. But in the vomiting of pregnancy we found that both the van den Bergh and the Rosenthal test showed changes.

DR. MILTON SMITH LEWIS, Nashville, Tenn.: If every one treated these cases conservatively, the mortality would certainly be better than by the more radical method. In both private and hospital practice I have been disappointed in the use of magnesium sulphate intravenously for the control of convulsions. Prior to 1929 I used magnesium sulphate as a routine. Since 1929 I have used sodium amytal intravenously in forty-four consecutive cases of eclampsia without a recurrence of convulsions; at no time was any other sedative used. It has been spectacular in my hands, for it not only controls the convulsions immediately but enables one to proceed with intelligent treatment without being constantly interrupted by further convulsions. I would emphasize the importance of not inducing labor or attempting to deliver the patient until she is completely out of shock. I am sure I have lost one or two cases for the simple reason that I did not wait until they were in proper condition for delivery. It is of paramount importance to have the patient in the best possible condition before any attempt is made to relieve her of the product of conception. In regard to cesarean section, in those rare cases in primiparas in which the cervix is rigid, with no evidence of dilatation, a cesarean section is occasionally indicated under local or spinal anesthesia, after the patient has been properly treated medically. I believe that digitalis is of great value in the treatment of eclampsia, especially in cases with beginning heart failure. I was glad to hear that Dr. Upshaw does not advocate large amounts of dextrose in concentrated solution; there is no doubt that it causes sclerosis of the veins. I have been particularly impressed with this by being unable to enter the veins of eclamptic patients who have been previously treated with dextrose solutions.

DR. PHIL C. SCHREIER, Memphis, Tenn.: A review of 170 cases taken from the teaching service of Dr. Toombs led to certain conclusions in regard to the treatment of eclampsia, some of which agree with Dr. Upshaw but in one or two particulars disagree. In the first place, magnesium sulphate as a sedative was disappointing. If only magnesium sulphate and not the morphine is given, I doubt seriously whether any sedative action can be demonstrated. When it is combined with morphine, credit is being given to magnesium sulphate that is really due to morphine. As a dehydrating drug, magnesium sulphate is of great value; it is also of some value as a diuretic. Other than that I do not see where it plays any great part in the control of convulsions. I noticed with interest that he performed two cesarean sections in spite of his conservative attitude. I was also convinced that there were certain selected cases which are best treated with cesarean section. However, preliminary to the section, medication in the form of hydration and elimination is most important. Included in our series were a number of cases treated in the early days of the service, when radicalism was the practice. Operation was performed immediately on admission without preliminary treatment, and the resulting mortality was prohibitive. Today all patients are treated conservatively from the time of admission, and section is determined on only when there is no satisfactory improvement after the lapse of about four hours. With such a program most cases are carried through conservatively and, on the other hand, those that come to section have been properly prepared to stand an operative procedure.

DR. E. D. PLASS, Iowa City: I should like to speak a good word for morphine sulphate, which, I believe, is the drug that should be made the basis of the conservative treatment of eclampsia. I advocate morphine sulphate given not according to any preconceived ideas but to a physiologic effect. It makes little difference how much is given so long as it is enough to reduce the respiratory rate. This drug has been more or less overlooked recently in the flood of newer additions to available medicaments. I believe that for the general practitioner, particularly, a return to morphine sulphate given to physiologic effect will help solve the problem of the treatment of eclampsia. Various other procedures may have a place secondary to this most important drug.

DR. C. B. UPSHAW, Atlanta, Ga.: Morphine sulphate in one-fourth grain (16 mg.) doses is not usually sufficient to control the convulsions of eclampsia. The control is effected by the combined or synergistic action of the morphine and the magnesium sulphate. I have used very little sodium amytal. I have felt that there is yet an element of danger in administration of this drug intravenously. However, I have in mind trying it in a series of eclampsia cases soon. So long as it is possible to report a low maternal mortality rate with present methods, I shall be cautious in making any changes in the routine treatment.

DR. JAMES C. JANNEY, Boston: I agree with Dr. Upshaw's ideas of conservative treatment. When it comes to the particular type of treatment, whether it is to be morphine or amytal or some other method, it seems to me that the choice will remain with the individual, as it does in the choice of treatment of various other obstetric conditions and conditions of general medicine. As regards Dr. Rowe's paper, there are just two things which I would like briefly to mention. In going over the literature of toxemia studies, it seems to be apparent that fifty cases of blood pressure are studied in one group of patients, the chemical changes in the blood of fifty cases in another group, and so on down the list; but there is no correlated study of all the various observations in the same patients, and that is the thing I am aiming to do. Whether it will show anything new in the field of toxemia, I don't know, but I am hoping it may. The next thing that interested me was the question of the involvement of the liver. Until a few years ago it was the general basis for the classification of toxemias of pregnancy that they were nephritic if they showed a definite involvement of the kidney. If they didn't show enough involvement of the kidneys to explain the clinical condition, they were supposed to be hepatic without any further evidence of hepatic involvement. But the recent rise in functional tests of the liver has given an opportunity to demonstrate hepatic involvement, not by the absence of kidney involvement, but because there are direct changes in the functional capacity of the liver. I have had no experience in these cases with the urea clearance test. It is a thing that I think should be done and I understand that in Dr. Stander's clinic they are laying a great deal of stress on the value of the information obtained from this test. These patients were studied at all times of the year with the exception of the middle of the summer, when the technicians in the laboratories were on vacation and the studies were necessarily limited. But the tests have covered a period of approximately two years and all seasons. The normal cases studied had no limitation in diet and no account of diet was taken into consideration because it was felt that the test as practiced was of such an acute nature, involving a tremendously high load of water and lasting for such a short time, that dietary changes would be of little account. As far as Dr. King's questions are concerned, the production of urine volume seems not to be equivalent or parallel to the severity of the toxemia. I can't make much further statement about that, except to say that there were a number of cases that were clinically normal in which tests performed a few days before a delivery showed an output which was very low and which was well within the toxemia limits, although there were no clinical signs of toxemia.

DR. A. W. ROWE, Boston: The bromsulphalein test was made on a number of these patients in common with many other methods of approach which I did not discuss in the presentation of this material. Seemingly it would have been well advised to curtail the exposition to even narrower limits. The bromsulphalein test, I feel, does not give clear-cut evidence as do many of the other methods, notably the more elaborate, more time-consuming and much more definite approach through the examination of the duodenal contents and the comparison of these various substances determined quantitatively with those of the long series of normal studies that have established criteria. The van den Bergh test is not to be taken, I think, with a large measure of seriousness, as negative results may be obtained when there is marked hepatic disturbance or vice versa. The bromsulphalein test was used in a number of these cases and parallels, so far as it is authoritative, the other observations.

RESISTANCE TO POLIOMYELITIS

THE RELATIVE IMPORTANCE OF PHYSIOLOGIC AND IMMUNOLOGIC FACTORS

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The various factors which collectively determine resistance or susceptibility to a communicable disease are so numerous and diverse that any attempt to disentangle the complex phenomena associated with the production of disease must of necessity be beset with the greatest technical difficulties. The occurrence of infection obviously is dependent on a delicate balance between the virulence of the invading micro-organism and the receptivity of the host. The relative significance, however, of exogenous and endogenous factors varies enormously among the infectious diseases. With high virulence of the etiologic agent, differences in individual predisposition of the host will frequently be obscured; a low innate susceptibility to a disease, on the other hand, may virtually obliterate the infectious character of its incitant. A rational analysis of resistance or susceptibility must, therefore, allocate in each instance proportionally a greater or lesser importance to specific immunologic and nonspecific physiologic factors. While in a large number, possibly a majority, of infectious processes, the protective mechanism is evidently based on the operation of more or less well recognized principles of immunity, reasoning along similar lines has failed to explain multiple instances of natural resistance in man and animals to pathogenic micro-organisms and powerful toxins. Almost every example of natural insusceptibility associated with the presence of antibody-like substance can be duplicated with an equally impressive example in which not the slightest specific antimicrobial action can be discerned in either the tissues or the fluids of the body. Conversely, more and more evidence is accumulating to show that the lack of natural resistance frequently is synchronized with fluctuations in the regulatory influence of certain nonspecific physiologic elements, such as age, sex, heredity, diet and endocrine activities.

Under a grant from the International Committee for the Study of Infantile Paralysis.

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Poliomyelitis has been a challenge to the imagination of the investigator because it represents the extreme example of an infectious disease in which the significance of the etiologic agent has become almost completely subordinated to the predominance of constitutional factors in the host. Insusceptibility to the disease apparently is so widespread that only under particular environmental circumstances does poliomyelitis ever assume epidemic proportions. The extent of this insusceptibility is no better illustrated than by an epidemiologic survey of the New York City Department of Health,[1] in which it proved impossible to establish contact with a previous case in 469 of 500 carefully investigated cases during the recent outbreak in this city. Were it not for the fact that the disease is definitely transmissible to the monkey in serial passage, one might readily understand why some skeptics time and again have raised the question of whether poliomyelitis may not, after all, be of endogenous origin.

Three features have been characteristic of nearly all epidemics of infantile paralysis: (1) the high rate of attack for children under 5 years of age; (2) the seasonal incidence which limits the epidemic waves to the late summer and fall months, and (3) the irregular spread of the infection in a given area. None of the theories proposed to explain the pathogenesis of the disease have succeeded in fully reconciling these seemingly heterogeneous facts. In this paper we shall endeavor to disclose the many inconsistencies in the historic belief that resistance is due exclusively to previous immunizing contact with the virus. On the other hand, we shall present evidence that points to certain nonspecific factors of a broader physiologic nature as being intrinsically, and perhaps predominantly, concerned with this protection.

Even more than the commoner diseases of childhood, poliomyelitis is largely restricted to the earliest years of infancy, almost all statistics indicating a peak incidence around the second year of life. Yet the assumption of a particular predisposition of the juvenile organism for the virus is hardly justified on the basis of this observation alone. Other infectious diseases, measles for instance, behave epidemiologically in a similar manner merely for the reason that a solid immunity is probably acquired by large strata of the population as a result of mild or severe attacks early in life. The actual number of cases of measles occurring year after year in all latitudes of the civilized world, together with the well known observation that on its introduction into a new environment all age groups are indiscriminately attacked, substantiates this epidemiologic hypothesis. Infantile paralysis, in contrast to measles, has emerged as a disease which selectively afflicted the prepubertal age groups in even the earliest instances for which we possess reliable records. This is true not only of its first recognized occurrence in various European countries but also of its original appearance in the United States. It is generally conceded that clinical cases of poliomyelitis are numerically far too few to account for a universal immunization of the adult population by reason of recovery from manifest attacks of the disease. Abortive poliomyelitis is, in the opinion of many competent observers, a type more heard about than seen,[2] although quite recently

1. Analysis of Poliomyelitis Epidemic, J. A. M. A. **97**: 1083 (Oct. 10) 1931.

2. Aycock, W. L.: The Epidemiology of Poliomyelitis, J. A. M. A. **87**: 75 (July 10) 1926. Forsbeck, F. C., and Luther, E. H.: Boston M. & S. J. **197**: 1175, 1927.

Paul, Salinger and Trask [3] have emphasized the importance of minor illnesses occurring during an epidemic. Certainly we shall have to insist on considerably more precise diagnostic criteria to be persuaded of the identity with Heine-Medin disease of noncharacteristic sporadic colds or diarrheas that occur in the summer. Attempts to establish a carrier rate among healthy persons sufficiently high to accomplish extensive subclinical immunization, such as has been postulated in the case of diphtheria, have failed because of experimental inadequacies to yield confirmatory data.

But even granting that the virus of poliomyelitis may be widely disseminated, the universal presence of an infectious agent per se is not invariably instrumental in limiting an endemic disease to the younger age groups by reason of latent immunization, as is best exemplified by the epidemiology of Malta fever.[4] Unfortunately, there exists no reliable test to determine previous contact with the virus on the basis of tissue sensitization, as is true for tuberculosis and vaccinia, for instance. While in a preliminary study [5] we obtained encouraging results with intracutaneous injections of heat-killed virus in children convalescing from poliomyelitis, later studies [6] revealed a tendency of many persons, particularly adults, to react nonspecifically to control material, namely, cord from a normal monkey, so that the proper interpretation of these cutaneous reactions at present is uncertain.

Perhaps one of the weightiest arguments in favor of the theory of immunization is the observation that the age distribution in epidemics of poliomyelitis seems to vary with the density of the population. Thus, since Wernstedt's [7] studies in Scandinavia and those of Frost [8] in this country, the age limits in rural epidemics, with rare exceptions, have been reported as slightly higher than those of urban epidemics. While the intrinsic force of this argument is undeniable, it should be remembered, as Friedemann [9] and Neufeld [10] have recently emphasized, that the greater exposure would naturally tend to make for a massing of the cases in the cities among the younger age groups. It is also true that such chance factors as racial, geographic and other local conditions of living, the potential influence of which are as yet not clearly understood, may profoundly affect the trend of age selection in a locality over a period of years. This is best illustrated by the extensive epidemic of 1931 in New York City in which only 53.3 per cent of the cases occurred in children under 5 years of age. This age distribution fully corresponds with that previously reported for rural epidemics [11] in the state of New York and in adjacent states. Moreover, in California the relation between rural and urban figures since 1930 has been directly reversed.[12] Considering the greatly increased intercommunication of late years, this trend toward an advance in the age line is directly contrary to what might be expected were immunity resulting from the presumably widely disseminated virus the major source of adult resistance.[13] The available evidence purporting to show an earlier maturation of urban than of rural population is controversial, although it is commonly admitted that the onset of menstruation in country girls is slightly later than in city girls.[14] The effect of environment on the rapidity of physiologic development is, however, too complex and the methods for measuring it are too uncertain for one to place implicit trust in this information.

A survey of the age distribution in European epidemics of poliomyelitis seems to indicate that the morbidity varies almost directly with the commonly accepted data regarding the onset of puberty in the different geographic areas. Unfortunately, the statistical material in the South (Italy, Spain and Rumania) is much smaller than in the North (Sweden, Norway, Iceland and Germany), but the parallelism between the age of greatest incidence of the disease and the age of the onset of puberty is at least suggestive.[15] The mortality figures for poliomyelitis in the southern and in the northern part of the United States, as collected by Doull,[16] reveal a similar tendency for the disease to attack the younger age groups in the south in spite of diminished chances for manifest exposure and a more recent invasion. That this tendency to concomitant variation is not due to a general restrictive influence of climate is indicated by the fact that the mortality rates for measles and whooping cough show no such discrepancies, although those of diphtheria and scarlet fever do so to some extent.

Another link in the chain of arguments for the theory of occult exposure and subclinical immunization is the widely quoted observation of Wernstedt that certain villages in Sweden which were severely attacked during the 1905 epidemic escaped the brunt of an epidemic occurring six years later in the same district. In view of the irregular spread of the infection in any given epidemiologic area, it is next to impossible either to prove or to disprove such a contention, even though the fact remains that during the progress of an epidemic the disease rarely returns to the point of its origin. Moreover, Wernstedt's observations are contrary to the experiences made in the United States. While a certain regional protection of brief duration has been occasionally noted, a tendency of the disease, after shorter or longer interepidemic intervals, to revisit by preference the same localities has been highly characteristic of numerous outbreaks. Silverman recently has drawn attention to the obvious failure of the theory of immunization to account for the fact that it is not uncommon for cases of poliomyelitis to occur in children who had ample opportunity for exposure and hence immunization to the virus as the result of continuous residence in the same locality during previous epidemics.[17]

The discovery that a high percentage of serums from normal adults is capable of inactivating the virus in vitro afforded new possibilities for the study of the moot problem. If we may assume that neutralization is a reliable index of protection—a fact not yet conclusively demonstrated—it seems that analysis of an adequate number of such tests should render it possible to determine accurately what percentage of the population has previously come into contact with the specific

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15. Monthly Epidemiol., Rep. League of Nations, Nos. 2 and 3, Feb. 15, and March 15, 1930.
16. Doull, J. A.: Am. J. Hyg. **8**: 633, 1928.
17. Silverman, A. C.: Science **76**: 345, 1932.

virus. Serious obstacles, however, prevent a noncritical acceptance of such evidence.

In the first place, the implied assumption that subinfectious doses of virus entering through a normal portal of entry leave a high and durable immunity cannot be verified experimentally. Thus we [18] failed to observe any demonstrable protection or antibody response in monkeys that had received nasopharyngeal sprays of live virus twice a week over a period of two and one-half months. This was recently confirmed by Flexner.[19] It is generally acknowledged that even when huge doses of virus are introduced by any other route active immunity can be obtained in the monkey only with great irregularity. These experimental results are difficult to harmonize with the postulated mass immunization in the human being, particularly when one considers that such an alleged immunization would have to be practically completed at a time of life when the capacity for antibody production against any antigen is notably at its lowest ebb.[20] The best evidence against the importance of contact immunization is to be found in Kramer and Aycock's [21] studies, which demonstrate a remarkable uniformity in the percentage of neutralization obtained with the serums of normal children in nonepidemic areas and the serums of children who had lived in an epidemic area with or without manifestations of abortive poliomyelitis. Thus the disease-producing power of the virus and its ability to immunize appear to be much less separable than the epidemiologic hypothesis calls for, a conclusion which Flexner and Amoss [22] had already reached in 1924 from the study of various human strains of different invasiveness in the monkey.

The second objection to the epidemiologic inference is that the specific origin of so-called natural antibodies can be unreservedly accepted no longer. Since the pioneering contributions of Hirszfeld and his co-workers,[23] a conception is gaining wide acceptance in modern immunology [24] which regards normal antibody formation against certain infectious and noninfectious antigens essentially as the expression of an endogenous, hereditarily fixed maturation process which reaches its climax around puberty rather than the effect of exogenous agencies. That is to say, the human being during the time of his most intense growth appears to pass through a period of serologic ripening—exemplified by the development of the isoagglutinins—during which certain normal protective functions of the blood, designed for the maintenance of the species, increase spontaneously in quantity, just as other anatomic and physiologic mechanisms of the body gradually become more fit and adapted for the struggle of life. The general validity of the Hirszfeld theory has been questioned on the ground that, while the capacity for immunologic response to infinitesimally small doses of antigen may conceivably vary with age, this does not necessarily prove the autochthonous origin of the normal antibody itself. This argument has lost much of its strength since Friedberger, Bock and Fuerstenheim [25] found that the development of normal antibodies against antigens with which parenteral contact is not ordinarily established, such as sheep hemolysins of the Forssman type and rabbit hemaglutinins, followed a similar curve, which showed an incline of juvenile evolution and a decline of senile involution. Moreover, the peculiar parallelism in the gradually increasing number of negative reactions to the Schick and the Dick tests through adolescence is said to prevail also with dysentery toxin which does not normally function as a ubiquitous antigen.[26] That certain antibodies against antigens of a limited dissemination are not physiologic properties of the serum but should be regarded as true immune substances is definitely known and has recently been shown by Hughes and Sawyer [27] to obtain in yellow fever. However, trypanocidal and anthracocidal [28] substances, precipitins for eel serum and agglutinins for starfish spermatozoa are generally present in serums from human adults. Who would seriously postulate promiscuous contact with these respective antigens in the normal walks of life?

Additional evidence in support of the phylogenetic origin of certain normal antibodies has come from recent epidemiologic observations. An increasing quantity of data is being collected which indicates that under certain extreme climatic conditions, such as prevail in the tropics or subtropics and in arctic regions, negative reactions to the Schick and the Dick tests may develop with puberty, at times in the presence only of sporadic cases of clinical diphtheria and scarlet fever or of healthy carriers of the respective organisms.[29] Certainly no compensatory increase in the rate of healthy carriers to offset the scarcity of the two diseases in hot countries has as yet been conclusively demonstrated. Thus the apparent dissemination of the infectious agent is often wholly out of proportion to the resistance that is seen to develop almost universally with age.

Normal neutralizing substances against poliomyelitis virus have been encountered under conditions suggesting complete or virtually complete absence of the specific virus. Thus normal sheep and horse serums and also serums from South American monkeys have occasionally been reported as virucidal. While the serum of immature rhesus monkeys is uniformly devoid of neutralizing power, we found serums from certain normal *adult* rhesus monkeys capable of neutralizing the virus.[30] The close analogy between this development of virucidal power with maturity in monkeys and a similar development with adolescence in man requires

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27. Hughes, T., and Sawyer, W. H.: Significance of Immunity Tests in Epidemiology as Illustrated in Yellow Fever, J. A. M. A. **99**: 978 (Sept. 17) 1932.
28. Anthracocidal substances are abundantly present in the serum during pregnancy and menstruation, as well as in the new-born infant (Dresel, E. G., and Freund, H.: Arch. f. exper. Path. u. Pharmakol. **91**: 377, 1921. Dresel, E. G., and Keller, W.: Ztschr. f. Hyg. u. Infektionskr. **97**: 151, 1922; **100**: 113, 1923. Keller, W.: Jahrb. f. Kinderh. **109**: 77, 1925). They are apparently formed in the normal rat with age (Ssacharoff, G. P.: Ergebn. d. allg. Path. u. path. Anat. **22**: 201, 1928).
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30. Jungeblut, C. W., and Engle, E. T.: Proc. Soc. Exper. Biol. & Med. **29**: 879, 1932.

no further comment. There are on record at present two sets of independent observations on the occurrence of virucidal substances in serums from normal human beings in regions with a comparatively low prevalence of clinical poliomyelitis. We are referring to the investigations of Aycock and Kramer [31] in Atlanta, Ga., and to those of Soule and McKinley [32] in Porto Rico. While in either instance a moderate dissemination of the virus cannot be safely excluded and there is a remote possibility that the disease may have been masked by adverse climatic influences, neither of these factors can be invoked for the neutralization of the virus which we obtained in a small series of tests with serums from adult natives of Greenland and of China.[33] Similarly impressive are the recent observations of Hudson and Lennette [33a] who recorded 90 per cent neutralization among twenty serums from adult Negroes in Liberia. The assumption, therefore, that normal poliocidal substances in the human serum must be formed *exclusively* as the result of previous contact with the virus rests on no firmer basis than traditional belief.

If one compares the actual figures reported by various investigators in different localities on the percentage of normal adult serums capable of neutralizing poliomyelitis virus, one finds them to be far from uniform. The range of variation in five urban American centers, Boston,[34] Chicago,[35] San Francisco,[36] Montreal [37] and New York,[33] extends from a high point of about 90 per cent of neutralization to a low one of about 50 per cent. While these discrepancies may perhaps in part be ascribed to the inherent crudeness of the virucidal test as commonly carried out, one cannot escape the impression that other unknown factors must contribute to produce such deviations. Aycock and Kramer [34] have submitted limited statistical material indicating a substantially lower incidence of neutralization among serums collected in rural than in urban areas. Since this difference occurred consistently both in adults' and in children's serums, the authors felt justified in interpreting their finding as suggestive of a less extensive contact immunization in sparsely settled regions. The apparent wide fluctuation in the neutralizing power of the serums of adults in various large cities, to which we have just called attention, detracts considerably from Aycock and Kramer's argument in accounting for the varying frequency of neutralization observed with adults' serums in rural and urban areas. The trend of the figures for the prepubertal group in the city and the country, on the other hand, is indeed persuasive, particularly since Shaughnessy, Harmon and Gordon [35] have reported similar observations. Unfortunately, the actual numbers in these critical age groups are so small at present that judgment should be suspended until a more extensive series of children under 10 years of age living under different environments has been studied.

Neutralization has heretofore been reported as a routine on the basis of only one given ratio of serum and virus, and this ratio has been fixed quite arbitrarily. While this procedure serves to standardize the test, a true picture of the neutralizing capacity is obviously not obtained. Our experience leaves us with no doubt that a number of serums failing to neutralize when equal amounts of serum and virus are tested do so readily after this ratio has been changed slightly in favor of the serum. Thus any differences in neutralizing power of individual serums at best are more quantitative than qualitative. To conclude then that quantitative differences in the serologic titer accurately reflect varying degrees of exposure would seem rather hazardous, since common immunologic experience proves that the antibody response following exactly the same dose of antigen may fluctuate tremendously from one animal to another. The importance of a constitutional factor on the formation of the poliocidal substance is well borne out by the wide variation in virucidal titer among neutralizing human serums when quantitative titrations are carried out.[38] This variation is so extensive that there is not even a consensus as to whether normal or convalescent human serums possess, on the average, the higher titer of virucidal substances.

Our own work [33] has shown that striking differences in the neutralizing power of serums from normal human adults become apparent when they are classified according to blood group. Thus only one third of the type A serums in our series were capable of neutralization when tested in the usual quantities, while four fifths of the type B serums possessed this property. The O serums occupied an intermediate position, approximately one-half neutralizing. These results strongly suggest that the genetic factor is infinitely more important than the hypothetic contact factor in influencing the neutralizing capacity of a person's serum. That we are not dealing with a chance phenomenon is indicated by a similar relationship between the blood group and the frequency of neutralizing power among serums from convalescent patients.[39] Further support is found in the correspondence between the blood group and the virucidal titer, B serums neutralizing on the average in many times higher dilutions than A serums. A similar constitutional deficiency in persons of type A to form diphtheria antitoxin after recovery from that disease has recently been described by Nowak.[40] However, while in the case of diphtheria the virulence of the incitant is evidently powerful enough to break down the constitutional barrier to infection, a selective effect of blood grouping makes itself felt in poliomyelitis, even on morbidity. Three authors [41] have so far reported a preponderance of type A among the victims of different outbreaks of poliomyelitis in Europe. Our own studies [39] during the last epidemic in New York City have rather yielded a reversal of the A:O ratio in favor of the O. At least three sets of observations, however, agree on a marked diminution of persons of type B. This was particularly evident in our own series among the older groups in which general susceptibility is running low. It is highly desirable that further studies on this problem be carried out in different parts of the world to determine whether predominance or shortage of any one blood group is due to serologic differentiation of the blood per se or

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37. Brodie, M.: J. Bact. **23**: 102, 1932.
38. Shaughnessy, Harmon and Gordon.[35] Schultz and Gebhardt.[36] Brodie.[37] Weyer, E. R.; Park, W. H., and Banzhaf, E. J.: J. Exper. Med. **53**: 553, 1931. Hudson, N. P., and Lennette, E. H.: J. Prev. Med. **6**: 335, 1932. Brodie, M.: J. Exper. Med. **56**: 507, 1932.
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whether it merely indicates a selective susceptibility of the various human races.

From the aforementioned discourse it will be clear that endogenous factors must be considered as exerting a dominating influence on the development of resistance to poliomyelitis. Precisely what those factors are is by no means certain. However, a number of observations suggest definitely that insusceptibility is intimately bound up with the normal rate of growth and physiologic development. There is likewise good evidence to indicate that a disturbance of this equilibrium may be responsible for the lack of resistance. Several statistical studies [42] show a renewed oscillation in the morbidity curve near the time of pubertal differentiation, coincident with a transitory phase of physiologic instability. Aycock [43] was among the first to point out that the fluctuation of morbidity in poliomyelitis with season and climate, in consonance with similar cyclic fluctuations in endocrine activities as observed in domesticated and feral animals, suggests the involvement of some abnormality in internal secretion in the pathogenesis of the disease. The numerous observations of Mills [44] also lead to the conclusion that physiologic modifications of the host may occur under the influence of seasonal variation. More weight was added to these speculations by Draper's [45] methodical observations on the presence of a definite endocrine stigma in children stricken with poliomyelitis. Quite apart from considerations such as those outlined, a number of clues can be found which indicate that even in adult age resistance to the disease apparently shows different levels of perfection associated with certain peculiarities of the reproductive system. Thus it is known that after puberty the incidence of infantile paralysis declines earlier and more abruptly in females than in males. A remarkable freedom of pregnant women from the disease during the greater part of pregnancy has been recorded [46] and equally impressive is the insusceptibility of the new-born infant. With the high level of natural resistance during pregnancy agree the observations of Aycock and Kramer [47] on the uniformity with which serums obtained from mothers at the time of delivery neutralize the virus. To this may be added our own experiments, which have demonstrated an appreciably higher virucidal titer for serums collected at various stages of pregnancy than is commonly found with normal serums.[48] While the transitory period of protection in the new-born baby is usually explained as evidence of passive antibody transfer, it should not be forgotten that the baby receives with the maternal blood certain of the circulating hormones, characteristic of adult age, which may be demonstrated in the new-born directly by biologic assay or may be recognized by their effect on the infantile genital organs.[49] It cannot be ignored that the two epochs of life which apparently constitute the highwater marks of natural resistance to poliomyelitis, i. e., early pregnancy and earliest infancy, coincide with periods during which well known temporary changes occur in the endocrine balance. Another example of physiologic fluctuation in endocrine activity is expressed in the rhythm of the menstrual cycle. Suggestive evidence has been offered to show that a definite alteration in cellular permeability, particularly in the function of the blood-spinal fluid barrier, occurs at the beginning of the menses.[50] A premenstrual drop in the bactericidal power of the blood has been reported by Geller.[51] Changes in the self-disinfecting power of the human skin with menstruation have also been described.[52] The relation between susceptibility to colds [53] and herpetic eruptions [54] and the onset of menstruation is a matter of frequent clinical record. That these various phenomena are causally related in some way to cyclic changes in the mutual relationship between ovarian and anterior pituitary secretions is more than likely. Resistance to poliomyelitis in connection with the menstrual cycle has not been adequately studied. In testing the serums of young women for virucidal power before and after menstruation we found in two of four instances that the serum of the same woman neutralized at one time and did not do so at another, although we have as yet been unable to recognize a uniform relation to one particular phase of the cycle.[48]

A direct experimental approach to the problem was made possible by the accumulation of knowledge during the last few years in connection with efforts to hasten sexual and genital maturity.[55] The two hormones which have attracted especial attention in this field are the follicular hormone of the ovary (estrin, theelin) and the gonad-stimulating principle of the anterior pituitary. A premature response of the genital system in immature female monkeys may be obtained with estrin and genital acceleration in either sex with certain extracts of the anterior pituitary. These active principles have been extracted in order to obtain relatively pure and potent substances which will cause specific changes in the structure and function of an organ or system of organs in an appropriate test animal. It is not suspected, at present, that all of the range of hormonal activity is extracted or recognized on biologic test. It should also be borne in mind that the action of the anterior lobe alone fails to induce pubertal maturation of the organism, in the strict sense.[56] Physiologic, morphologic and serologic maturity evidently reflect the sum total of a number of biologic factors. Hence true physiologic maturity cannot be said to have been produced until all endocrine secretions are applied in proper sequential relations and quantities.

By following the methods usually employed in the field of experimental endocrinology, which of necessity involve the use of a single hormone at a time, we have attempted to induce in immature monkeys certain physical changes which, in a sense, might be comparable to those existing in the adolescent human being. When the female sex hormone or the gonadokinetic principles of the anterior lobe were used, the response of the genital system was an excellent criterion of the activity of the hormone; with thyroid and suprarenal cortical preparations no such accurate check was possible. To obtain the effect of the gonad-stimulating hormone of the anterior pituitary in potent form we utilized either fresh implants from rats (Smith) or pyridine extracts

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48. Jungeblut, C. W., and Engle, E. T.: J. Immunol., to be published.
49. (*a*) Scammon, R. E.: Proc. Soc. Exper. Biol. & Med. **23**: 687, 1926. (*b*) Philipp, E.: Zentralbl. f. Gynäk **53**: 2386, 1929. (*c*) Neumann, H. O., and Peter, F.: Ztschr. f. Kinderh. **52**: 363, 1932. (*d*) Data reviewed by E. T. Engle, in Allen, Edgar: Sex and Internal Secretions, Baltimore, Williams and Wilkins Company, 1932, p. 787.
50. Benda, R.: München. med. Wchnschr. **72**: 1686, 1925.
51. Geller, F. C.: Klin. Wchnschr. **9**: 1705, 1930.
52. Fisher, V.: Proc. Soc. Exper. Biol. & Med. **28**: 952, 1931.
53. Maciejewski, K.: Thesis, Berlin, 1930.
54. Lauda, E., and Luger, A.: Ergebn. d. inn. Med. u. Kinderh. **30**: 377, 1926.
55. It is impossible here to quote in extenso the numerous publications in the field of experimental endocrinology which bear on this problem. This literature will be found reviewed in the volume edited by Edgar Allen.[49d]
56. Engle, E. T.: Endocrinology **15**: 405, 1931.

prepared from the dried pituitary glands of sheep. Another anterior lobelike substance was readily available in the urine of pregnant women, where its presence forms the basis for the well-known Aschheim-Zondek and Friedman tests for the diagnosis of pregnancy.

In an extensive investigation [57] covering an experimental material of approximately 100 monkeys and involving the use of numerous hormones, we succeeded in some exceptional instances in obtaining complete or partial protection in monkeys after prolonged treatment with an active fraction of the anterior lobe or similar principles precipitated from the urine of pregnant women. The severity of the intracerebral inoculation—unfortunately the only method which guarantees a 100 per cent infectivity among the controls—at once creates a considerable experimental handicap. While individual protection against intracerebral infection is therefore rarely demonstrable, the presence of virucidal substances in the serum may be considered a good criterion of an acquired partial resistance.[58] For this reason we have tested the serums of a small number of hormone-prepared monkeys for neutralizing action in vitro. At the present ten of twenty-four samples obtained after treatment with anterior pituitary extracts or similar principles recovered from the urine of pregnant women were capable of inactivating the virus completely while two additional serums showed partial neutralization. The results obtained with other hormones up to the present time have been either uniformly negative or too irregular to warrant detailed description.

Whether these nonspecifically induced virucidal substances in the monkey as well as the normally occurring protective substances in man are identical with the specific immune body resulting after active immunization or recovery remains uncertain in the absence of more concrete knowledge. So far we have been unable to absorb the neutralizing substance in either the serum from the monkey or that from man by contact with the virus in vitro.

Any interpretation of the numerous divergent facts assembled in this brief survey is impossible without the risk of being accused of a certain hastiness of judgment. With so many conflicting deductions based on circumstantial evidence and only a limited supply of experimental data, all serious attempts that have been made to elucidate the problem of susceptibility and insusceptibility in poliomyelitis are subject to the same charge. However, it seems apparent that even on the assumption of a wide dissemination of the infectious agent the current conception which regards adult resistance to the disease as due exclusively to subclinical immunization meets with perplexing difficulties. On the other hand, epidemiologic observations and experimental facts can be reconciled with a point of view emphasizing the normal endocrine balance characteristic of mature age as a major source of this protection. Whether the mechanism of resistance can be accounted for on this basis alone or whether physiologic conditions jointly with immunologic processes are responsible for the peculiarities of infantile paralysis, only continued research can show. It is entirely conceivable that some unusual adjustment of both these factors might explain the mysteries of this disease more adequately than any other hypothesis hitherto promulgated.

57. Jungeblut, C. W., and Engle, E. T.: Susceptibility Problems in Poliomyelitis, Am. J. Dis. Child. **43**: 523 (Feb.) 1932.

58. Aycock, W. L., and Kagan, J. R.: J. Immunol. **14**: 85, 1927. Stewart, F. W., and Rhoads, C. P.: J. Exper. Med. **49**: 959, 1929. Rhoads, C. P.: ibid. **51**: 1, 1930. Jungeblut, C. W., and Hazen, E. L.: Proc. Soc. Exper. Biol. & Med. **28**: 10, 1930.

CONCLUSIONS

1. The widely accepted hypothesis which postulates that the resistance of adults to poliomyelitis is due exclusively to universal subclinical immunization against the virus is inconsistent with a number of epidemiologic observations bearing on the age distribution in various latitudes and the recent trend towards an advance in the age line.

2. The assumption of a unique immunizing power of the virus in the absence of disease production cannot be verified experimentally.

3. The opinion that natural virucidal substances in the serums from human adults can develop only through previous contact with the specific antigen is open to criticism because of their apparent formation in man and monkeys under conditions which preclude the presence of the virus.

4. The evidence in support of the current concept that the incidence of virucidal serums in human adults stands in direct relation to the density of population should be reviewed since individual serums may show wide discrepancies in virucidal power, which seems to vary with the blood group and to fluctuate with changes in the physiologic state of the body.

5. In a restricted number of instances it has been possible to demonstrate that virus-neutralizing substances may occur in the serum of immature monkeys after prolonged treatment with anterior pituitary extracts or similar principles recovered from the urine of pregnant women.

6. The suggestion is offered that the mass protection enjoyed by the adult human population rests primarily on the normal function of the endocrine balance characteristic of mature age.

ABSTRACT OF DISCUSSION

DR. W. LLOYD AYCOCK, Boston: It appears that by viewing epidemiologic data, not in perspective with related observations but only from the point of view of their contention, the authors attempt to support a hypothesis which, although originally based on the apparently erroneous observations of Friedberger, might have been entertained seriously before such conclusive evidence of the antigenic origin of immunity was available as has been presented by Sawyer and his co-workers in the case of yellow fever, and by Morales in the case of diphtheria. It can only be said that if sexual or physiologic maturation is the cause of subclinical immunity, they are possible only when disease is present and that there is a different sexual or physiologic maturity for each of a considerable number of diseases and that it begins in infancy and reaches its height at the grave.

DR. FOSTER M. JOHNS, New Orleans: The authors' conclusions, from theoretical, comparative and experimental standpoints, are that while the normal bodily tissues undoubtedly require a definite period of maturation which reaches stability at puberty, the necessary quantity of immunity possessed by the animal is directly influenced by the general stimulation of certain endocrine gland secretions. Instances of the close correlation of general immunity to unquestioned gonadal and pituitary hyperfunction are so numerous as to make comment almost useless. The accepted ratio of six diphtheria cases in the white race to one in the Negro is somewhat analogous to the biologic differences shown by the biologically different groups differentiated in the white race by blood types. The exact mechanism of this aging of tissue with its increase of resistance to infection has become much nearer solution since the work of Avery, which places the antibody stimulant for several widely different types of bacteria in a polysaccharide that may require just so many years, or the acquisition of certain habits of diet incidental to normal growth to build up gradually a general immunity to many invasive parasites, be they animal or bacterial. How else can the relative immunity

be explained of adults to such relatively complex structures as the intestinal parasitic worms whose larvae die in passage through adult tissue? Not every one has had ascaris infection as a child, and yet the inability to infect adults is a matter of common knowledge. While the authors seem to have obtained a selective action by the injection of certain extracts and have failed with others, the antigenic fractions of these parenterally injected extracts may have been quite different. I would be inclined to suspend judgment, or at least not take the next step, which would be the utilization of this means therapeutically, until the certainty of a definite immunologic response has been obtained in many other infectious processes.

DR. C. W. JUNGEBLUT, New York: I fully realize that the view developed in this paper is unusual and perhaps may be considered by some rather advanced. At the present stage of knowledge in the fields of pathology and immunology it is difficult to concede that resistance against an infectious disease may be so largely bound up with nonspecific factors. However, the approach to many hitherto obscure nosologic problems must take cognizance of these factors if real progress is to be made. Dr. Aycock misinterpreted our concept of age resistance. We did not speak of sexual maturity per se but of the general physiologic maturity, of which sexual ripening is merely a part and an expression. Friedberger's observations on the spontaneous formation of normal antibodies against a noninfectious antigen by age have no other relation to our own work than that of an analogy. As to the correctness of these observations I can vouch from personal experience. As far as Dr. Aycock's reference to yellow fever is concerned, the comparison of two diseases so dissimilar is not apt to clarify the issue. Through Dr. Sawyer's courtesy we have been able to examine some of the same Chinese serums that he found devoid of virucidal property against yellow fever virus. All these serums have neutralized the virus of poliomyelitis; and poliomyelitis in China is almost as rare as yellow fever.

URINARY ANTISEPSIS

A COMPARISON OF METHENAMINE, CAPROKOL, PYRIDIUM AND ACRIFLAVINE AS TO CLINICAL EFFICIENCY

EDWIN DAVIS, M.D.
AND
J. C. SHARPE
OMAHA

We propose merely to present the results of one method only of attempting to evaluate certain drugs used for the purpose of internal urinary antisepsis. Incidentally, we hope to direct attention to the subject of commercial exploitation in the drug trade, using these results by way of illustration.

THE PROBLEM OF INTERNAL URINARY ANTISEPSIS

The experimental requirements of the ideal internal urinary antiseptic have been defined (Davis [1]) as that drug "which is chemically stable, nontoxic, and nonirritating to the lower urinary tract; which is antiseptic in high dilution (in urine, as well as in water), and which is eliminated unchanged in high percentage by the kidney." An assumption, however, is involved in expecting the drug that possesses these experimental requirements to be (necessarily) clinically efficient in eliminating existing infections in the urinary tract. As has likewise been pointed out (Davis [2]), there is a distinction between experimental fitness and practical clinical application, since the test tube experiment is not exactly duplicated within the living human urinary tract. In addition to the influence exerted by certain well recognized accessory or predisposing causes of urinary tract infection (which may be grouped under the main headings urinary retention, calculus, new growth, tuberculosis and focal infection), there are unknown factors which enter in. The problem, therefore, comes to be one of great complexity. That this subject is one of more than mere passing interest is indicated by publications by one of us (E. D.) which have appeared at intervals over a period of years. Experimental work on this subject, begun with compounds related to phenolsulphonphthalein, was later extended to include a large number of aniline dyes (Davis [3]). From the total number of compounds investigated (more than 400 published, and an additional 200 unpublished), acriflavine (Davis and Beck [4]) was the only one selected as possessing properities sufficiently nearly fulfilling the experimental requirements to justify a clinical trial.

A publication which appeared in 1924, summarizing clinical results following the oral administration of acriflavine (Davis [5]), was concluded, in part, as follows:

(1) A large proportion of cases of *acute* urinary tract infection have shown prompt improvement, characterized by a drop in temperature, a disappearance of bladder symptoms, a macroscopic clearing of the urine, and a disappearance of bacteria from the urine. Relapses in these cases have been the exception.

(2) *Chronic* urinary infections have not readily responded. Improvement was noted in only 60 per cent of cases, and in many of these the pus and bacteria reappeared in the urine after discontinuing the treatment.

(3) Mild catharsis or nausea was observed in approximately 30 per cent of the patients. This was due in part to the bicarbonate, since in some instances these symptoms preceded the dye administration. In 5 per cent of the cases, vomiting and diarrhoea were such as to contraindicate the use of the drug. No further ill effects have been noted.

(4) The indiscriminate use of acriflavine, in unselected cases, and without regard to the elimination of the "accessory causes of urinary infection, is distinctly inadvisable."

It will be seen from the foregoing that no extravagant claims have been made as to the clinical efficiency of acriflavine. Experience to date has not led us to change these conclusions.

Stating the experimental requirements of the ideal internal urinary antiseptic more simply and concisely, it may be said that any drug, to qualify for this purpose, must have properties such that, administered to a normal person in noninjurious dosage, it will cause that person to secrete urine which is an unfit culture medium for ordinary bacteria. It is perhaps conceivable that a given drug which fails to meet this simple standard could be of clinical value in curing urinary tract infections, but such a theory clearly has no logical basis. As has also been pointed out (Davis [2]), to attempt conclusively to prove the clinical value of a given "experimental" urinary antiseptic is to enter into a problem of far greater complexity than the original laboratory work indicating the fitness of that same drug from a theoretical viewpoint. The treatment of each

From the University of Nebraska College of Medicine.

Read before the Section on Urology at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 13, 1932.

1. Davis, Edwin: Urinary Antisepsis: A Study of the Antiseptic Properties and the Renal Excretion of Compounds Related to Phenolsulphonephthalein; Preliminary Report, J. A. M. A. **70**: 581 (March 2) 1918.

2. Davis, Edwin: Urinary Antisepsis: The Clinical Application of Experimental Data, Minnesota Med. **9**: 151 (April) 1926.

3. Davis, Edwin: Urinary Antisepsis: A Study of the Antiseptic Properties and the Renal Excretion of 204 Anilin Dyes, Am. J. M. Sc. **161**: 251 (Feb.) 1921.

4. Davis, Edwin, and Beck, G. H.: Urinary Antisepsis: The Secretion of Antiseptic Urine by Man Following the Oral Administration of Proflavine and Acriflavine: Preliminary Report, J. Urol. **5**: 215 (March) 1921.

5. Davis, Edwin: Urinary Antisepsis: Clinical Results Following the Oral Administration of Acriflavine, J. Urol. **11**: 29 (Jan.) 1924.

patient is an individual clinical experiment, which is necessarily lacking in the "control" which we are able to apply to laboratory experiments. Among the many confusing variable factors which enter into each clinical trial, probably the chief cause for inaccuracy in interpretation of results is the spontaneous or unexplained day-to-day variation, which is frequently observed in the pus and bacterial content of the urine of a given person. That urine which is cloudy and infected today may be clear and sparkling tomorrow, for no known reason. Coincident with these variations in the urine, we are accustomed to see alternating periods of exacerbation and spontaneous improvement in the clinical symptoms. In these cases, there is therefore every opportunity for the *post hoc, ergo propter hoc* fallacy to enter in. For these reasons, opinions as to drug efficiency, based on published clinical impressions, are by no means to be considered wholly reliable.

METHOD OF INVESTIGATION

We have therefore omitted from this presentation all reports of clinical cures of urinary tract infections, as well as all experimental work dealing purely with in vitro bacteriologic tests of antiseptic efficiency. We are attempting merely to answer the one semiexperimental and semiclinical question as to whether a given drug, administered to normal persons in unit maximum dosage, does or does not cause the secretion of antiseptic urine. We make no attempt either to question or to confirm other clinical or laboratory reports concerning these same drugs.

TECHNIC

A group of twelve normal male adults, on routine diet and average water intake, was selected. In the case of each drug, what was considered to be unit safe maximum dosage was determined on. From each person one control sample of urine was obtained just prior to drug administration, and three samples of drug-containing urine were taken at intervals of two, four, and eight hours afterward. The samples of urine were collected merely by cutting into the urinary stream with a sterile flask. Ten cubic centimeter amounts from each sample were transferred to each of two sterile test tubes, which were immediately inoculated from twenty-four hour broth cultures of strains of the colon bacillus and staphylococcus which had previously been isolated from clinical cases of urinary tract infection. In order to guard against too heavy inoculation, the original twenty-four hour broth culture in each case was first diluted by the transfer of one loop to 10 cc. of sterile broth, and loop transfers to the urine tubes were made from the latter. The urine tubes were then incubated for twenty-four hours, after which one standard loop was transferred from each tube to 10 cc. of melted agar and plated. The plates were read after an incubation period of twenty-four hours. It was considered that by this method the number of colonies on the agar plates should serve as an accurate index as to whether the bacteria, during the twenty-four hour incubation period in drug-containing urine, had been killed, inhibited or permitted to grow and develop.

RESULTS

It is to be noted that the symbols in the tables designate the approximate number of colonies which developed in agar plates, each containing one standard loop transferred from a drug-containing urine tube, which had previously been inoculated and incubated for twenty-four hours at 37 C. It is not open to question that those plates showing innumerable small colonies in countless myriads (symbol, In.) were inoculated from urine tubes in which growth and development had taken place during the twenty-four-hour incubation period, *in spite of the presence of the drug.* It is to be recalled that the urine tubes were lightly inoculated. Each tube received merely one loop from a 10 cc. tube of sterile broth, to which one loop from a twenty-four hour broth culture had been added. It is therefore clear that there was a total lack of antiseptic power in all urine tubes from which plates showing innumerable colonies were inoculated. Those plates containing an easily countable number of colonies (symbol, Few) were inoculated from urine tubes in which it is evident that the drug had exerted a definite, antiseptic or inhibitory action, although insufficient to kill the organism during the twenty-four hour incubation period. It will be understood that the symbol Few has necessarily been somewhat loosely employed, to signify merely an easily countable number of colonies (several to several hundred), in marked and unquestionable contrast with the plates inoculated from the corresponding control (or drug-free) samples of urine and showing countless myriads of colonies. The sterile plates (symbol, 0) show that the bacteria were killed by the drug-containing urine during the twenty-four hour incubation period. Proof of this is established beyond doubt by comparison with the plates containing innumerable colonies inoculated from the drug-free or control samples of urine, obtained from the same persons just prior to drug administration, and similarly handled. By way of summary, it may be stated that the three symbols 0, Few and In., indicate that the corresponding, drug-containing samples of urine were germicidal, inhibitory or inert, respectively.

TABLE 1.—*Results with Pyridium* *

Patient	Dose, Gm.	Urine Obtained Before Administration C	Urine Obtained Before Administration S	Urine Obtained After Administration: 2 Hours C	2 Hours S	4 Hours C	4 Hours S	8 Hours C	8 Hours S	Subjective Symptoms
Baker.....	0.4	In.	In.	In.	In.	In.	In.	In.	In.	Backache
Shoemaker	0.4	In.	In.	In.	In.	In.	In.	In.	In.	Headache
Coates.....	0.4	In.	In.	In.	In.	In.	In.	In.	In.	None
Hager.....	0.4	In.	In.	In.	In.	In.	Few	In.	Few	None
Sanders....	0.4	In.	In.	In.	In.	In.	In.	In.	In.	None
Sears.....	0.4	In.	In.	In.	In.	In.	In.	In.	In.	None
Haller.....	0.4	In.	In.	In.	In.	In.	0	In.	In.	None
Pennoyer..	0.4	In.	In.	In.	In.	In.	Few	In.	In.	Abdominal cramps
Rehder.....	0.4	In.	In.	In.	In.	In.	In.	In.	In.	None
Jensen.....	0.4	In.	In.	In.	In.	In.	0	In.	In.	None
Reitz.....	0.4	In.	In.	In.	In.	In.	In.	In.	In.	None
Jewel.....	0.4	In.	In.	In.	In.	In.	In.	In.	In.	None

* In the tables the columns indicate number of colonies which developed in agar plates containing one standard loop transferred from urine tubes which had previously been inoculated and incubated for twenty-four hours. C, the colon bacillus; S, the staphylococcus; 0, no colonies, indicating germicidal strength during twenty-four hours at 37 C.; Few, countable number of colonies, indicating inhibitory strength; In., innumerable colonies, indicating growth and development in the drug-containing urine.

As may be determined by inspection of table 1, pyridium, administered in 0.4 Gm. dosage, is inert as far as inhibiting the growth and development of the colon bacillus in samples of urine subsequently voided is concerned. This organism grows in pyridium-containing urine as luxuriantly as in the control samples. With only an occasional exception, likewise shown in table 1, the same applies to the staphylococcus. Judged by this standard, therefore, pyridium has practically no effect other than to color the urine. Subjective symptoms were not serious, but were not wholly lacking. Three or four of the patients complained of headache, backache and abdominal cramps. It is to be noted that in this experiment, in order to eliminate the question of tardy absorption of the pills, the drug was administered in powder form, in capsules.

Caprokol (hexylresorcinol), in unit 0.75 Gm. dosage, is likewise inefficient in causing the normal person to secrete urine which is dependably antiseptic. As shown in table 2, this drug is practically inert in the two hour and eight hour samples, but exerts a definite antiseptic action against both organisms in the four hour specimens, in about one third of the samples. Three of these patients complained of abdominal cramps.

TABLE 2.—*Results with Caprokol* *

Patient	Dose, Gm.	Urine Obtained Before Administration C	S	Urine Obtained After Administration: 2 Hours C	S	4 Hours C	S	8 Hours C	S	Subjective Symptoms
Black.....	0.75	In.	In.	In.	In.	0	In.	In.	In.	Abdominal cramps
Shoemaker	0.75	In.	In.	In.	In.	In.	0	In.	In.	Abdominal cramps
Casebeer...	0.75	In.	In.	In.	In.	In.	0	In.	In.	None
Sharpe.....	0.75	In.	In.	Few	In.	0	In.	In.	In.	None
Hager.....	0.75	In.	In.	In.	In.	In.	In.	In.	In.	Nausea
Haller.....	0.75	In.	In.	Few	In.	0	In.	In.	In.	None
Jensen.....	0.75	In.	In.	In.	In.	Few	0	In.	0	None
Pennoyer..	0.75	In.	In.	In.	In.	In.	In.	In.	In.	None
McClatchy	0.75	In.	In.	In.	In.	0	In.	In.	In.	None
Kinoshita..	0.75	In.	In.	In.	In.	In.	In.	In.	In.	None
Coates.....	0.75	In.	In.	Few	In.	In.	0	In.	In.	Abdominal cramps
Rogers.....	0.75	In.	In.	In.	In.	In.	In.	In.	In.	None

* In. means innumerable colonies; Few, few colonies, and 0, no growth.

Methenamine, in unit dosage of 1 Gm. (table 3), exerts a definite antiseptic action against both the colon bacillus and the staphylococcus in all three (two, four and eight hour) samples of urine. In the majority of instances these methenamine-containing samples were germicidal as well as antiseptic. The contrast is so striking (tables 1, 2 and 3) that the antiseptic efficiency of pyridium or caprokol (as determined by this method, in normal urine) is not even to be compared with that of methenamine. Furthermore, it is particularly to be noted that these tests were carried out without the administration of any drug with the purpose of insuring urinary acidity. The antiseptic efficiency of methenamine against both the colon bacillus and the staphylococcus (somewhat more marked against the latter) is evident in 50 per cent of the samples after two hours, and in 75 per cent of the four hour and the eight hour samples. The necessity for an acid medium for the liberation of formaldehyde from methenamine is well known. Helmholz [6] has recently shown that for efficient antiseptic action of methenamine in urine the p_H must be below 5.5, and preferably near 5.0, and that "at a p_H of 5.0, urine, with a 0.5 per cent concentration of methenamine, can be sterile after four hours at 37 C." The point to be made is that in an experiment with methenamine such as the one here reported, the percentage of efficiency could doubtless be increased by methods directed toward insuring increased urinary acidity. Helmholz advises ammonium chloride for this purpose. In this experiment the urinary acidity was merely that of the average normal healthy person (about p_H 6.0).

TABLE 3.—*Results with Methenamine* *

Patient	Dose, Gm	Urine Obtained Before Administration C	S	Urine Obtained After Administration: 2 Hours C	S	4 Hours C	S	8 Hours C	S	Subjective Symptoms
Black.....	1	Few	Few	0	0	0	0	0	0	None
Shoemaker	1	In.	In.	In.	0	0	0	0	0	None
Casebeer...	1	In.	In.	In.	Few	0	0	In.	0	None
Sharpe.....	1	In.	In.	In.	In.	In.	In.	In.	0	None
Hager.....	1	In.	In.	In.	0	In.	0	In.	Few	None
Haller.....	1	In.	In.	In.	In.	In.	Few	In.	0	None
Kinoshita..	1	In.	In.	In.	0	0	0	0	0	None
Pennoyer..	1	In.	In.	In.	0	In.	0	0	0	Nausea
McClatchy	1	In.	In.	In.	0	In.	0	In.	0	None
King.....	1	In.	In.	0	0	0	0	0	0	None
Ralston....	1	In.	In.	0	0	0	0	0	0	None
Coates.....	1	In.	In.	0	0	0	0	In.	0	None

* In. means innumerable colonies; Few, few colonies, and 0, no growth.

6. Helmholz, H. F.: Personal communication to the authors.

Acriflavine (table 4), administered in 0.2 Gm. dosage, in capsules, causes the killing of both the colon bacillus and the staphylococcus in the four hour samples of urine, with clocklike and unfailing regularity, as well as in 50 per cent of the two hour samples and 75 per cent of the eight hour samples. This remarkable consistency in the antiseptic action of acriflavine in the urine of normal persons is in confirmation of results previously published (Davis and Beck [4]). This conclusion, therefore, as to the efficiency of acriflavine, from a semiexperimental and semiclinical viewpoint, is inescapable. It is to be noted, however, that urinary alkalinity is quite essential for consistent and dependable results such as this with acriflavine. Each of these persons, prior to drug administration, had received sufficiently large doses of sodium bicarbonate to insure urinary alkalinity.

TABLE 4.—*Results with Acriflavine (Capsules)* *

Patient	Dose, Gm.	Urine Obtained Before Administration C	S	Urine Obtained After Administration: 2 Hours C	S	4 Hours C	S	8 Hours C	S	Subjective Symptoms
Black.....	0.2	In.	In.	In.	In.	0	0	0	0	Diarrhea
Shoemaker	0.2	In.	In.	In.	In.	0	0	In.	0	Vomiting
Casebeer...	0.2	In.	In.	In.	In.	0	0	0	0	None
Coates.....	0.2	In.	In.	In.	In.	0	0	0	0	Nausea
Hager.....	0.2	In.	In.	Few	0	0	0	0	0	None
Haller.....	0.2	In.	In.	In.	In.	0	Few	In.	0	None
Jensen.....	0.2	Few	In.	0	0	0	0	Few	0	Diarrhea
Pennoyer..	0.2	In.	In.	0	Few	0	0	0	0	Nausea
McClatchy	0.2	In.	In.	Few	0	0	0	In.	0	Vomiting
Huntley...	0.2	In.	In.	In.	0	0	Few	In.	0	Vomiting
Meeske.....	0.2	In.	In.	0	0	0	0	In.	Few	Diarrhea
King.....	0.2	In.	In.	0	0	Few	0	In.	0	Nausea

* In. means innumerable colonies; Few, few colonies, and 0, no growth.

With respect to acriflavine, it is also essential to direct attention to the fact that the method of administration is of far-reaching consequence so far as antiseptic efficiency is concerned. As shown in table 5, the identical preparation of this drug, in equivalent dosage, in shellac-coated pills is practically inert. Almost without exception, the organism grew in the samples of urine obtained following the administration of these pills as luxuriantly as in the control samples. The contrast between tables 4 and 5 is so striking as to establish this fact beyond question, although the reason remains undetermined. A plausible explanation of this discrepancy is afforded by the assumption that there is a variation in the absorption rates of this drug in the stomach and in the intestine, since the enteric coating prevents absorption of the acriflavine (in pill form) in the stomach. Regardless of the explanation, the essential fact to remember is that failure to obtain results following the shellac-coated pills is not to be attributed to the inefficiency of the drug itself. At this time we are not prepared to express an opinion as to the efficiency of other forms of enteric-coated acriflavine pills.

COMMERCIALISM IN THE DRUG TRADE

In view of the apparent discrepancy between advertising claims and results here outlined, a brief comment on the general subject of commercial exploitation does not seem out of place.

Big business, geared to overproduction and handicapped by competition and by the high cost of maintaining elaborate organization, is dependent for its very existence on efficient, nation-wide distribution and sales volume. Hence the necessity for high-pressure salesmanship and extensive advertising programs, and the reason for advertising claims which tend to become both extravagant and fanciful, and which may be not only untrue, but obviously so. Anyone who reads modern newspapers and magazines is familiar with the type of fanciful advertising claims which lead the reader to wonder whether the advertiser is mentally unbalanced, or whether he (the advertiser) thinks that the public is mentally unbalanced. In this connection, it is not intended to refer to any particular industry nor to imply that these claims are deliberate misrepresentations. This tendency may be ascribed to overenthusiasm, or to an attitude of mind created by the necessity of maintaining sales volume. Most of this advertising matter may be considered semihumorous or ridiculous, rather than injurious. Without referring to any special article, there are advertising slogans without number which every one knows are not true, and which no one expects to be true. Descriptive superlatives have become meaningless, by reason of their very abundance.

The purpose of this comment, however, is to direct attention to the fact that this tendency is making itself evident in the legitimate drug trade, where it is not so humorous as, for instance, in the cigaret trade. Full page advertisements in ten colors on heavy paper in leading medical journals do not establish the clinical value of any given pharmaceutic product. Nor is therapeutic efficiency increased by fancy wrappings. A drug either has properties whereby it accomplishes (in a certain measure) the purpose for which it is recommended, or it has not. It would seem that acceptance of a given drug by the Council on Pharmacy and Chemistry of the American Medical Association should be withheld pending conclusive demonstration of the clinical efficiency of that drug. Regardless of the display of scientific investigation made by the various drug corporations, the truth remains that the chief interest of the drug trade lies in manufacturing and distribution, and that research, at best, is to be regarded merely as a means to an end. Finally, mention should be made of the immunity from investigation and criticism which big business, under the cloak of respectability, seems to enjoy. The question therefore arises as to whether the average physician, in making an honest effort properly to prescribe for his patient, is to be guided by testimonials, by clever salesmen, by colored advertisements, by personal experience, by published clinical impressions, by the attitude of the Council on Pharmacy and Chemistry, or by the results of carefully and accurately controlled laboratory investigation. None of these methods is wholly dependable in all cases.

TABLE 5.—*Results with Ariflavine (Shellac-Coated Pills)* *

		Urine Obtained Before Administration		Urine Obtained After Administration						
				2 Hours		4 Hours		8 Hours		
Patient	Dose, Gm.	C	S	C	S	C	S	C	S	Subjective Symptoms
Black.....	0.2	In.	In.	Few	In.	0	In.	In.	In.	None
Shoemaker	0.2	In.	In.	In.	In.	Few	In.	In.	In.	None
Casebeer...	0.2	In.	In.	In.	In.	In.	In.	In.	In.	Headache
Coates.....	0.2	In.	In.	In.	In.	In.	In.	In.	In.	None
Hager.....	0.2	In.	In.	In.	In.	In.	In.	In.	In.	None
Haller.....	0.2	In.	In.	In.	In.	In.	In.	In.	In.	Headache
Jensen.....	0.2	In.	In.	In.	In.	In.	In.	In.	In.	None
King.....	0.2	In.	In.	In.	In.	In.	In.	In.	In.	None
McClatchy	0.2	In.	In.	In.	In.	In.	In.	In.	In.	None
Huntley...	0.2	In.	In.	In.	In.	In.	In.	In.	In.	None
Meeske.....	0.2	In.	In.	In.	In.	In.	In.	In.	In.	None
Rogers.....	0.2	In.	In.	In.	In.	In.	In.	In.	In.	None

In. means innumerable colonies; Few, few colonies, and 0, no growth.

SUMMARY

1. As determined by antiseptic tests made before and after administration, pyridium, given in capsules to normal persons in unit maximum dosage (0.4 Gm.), colors the urine.

2. Caprokol (dose, 0.75 Gm.), judged by the same standard, exerts an irregular and transient antiseptic action in about one third of the four hour samples.

3. Methenamine (dose, 1 Gm.) is incomparably more efficient than either pyridium or caprokol in causing the normal person to secrete urine which is antiseptic against both the colon bacillus and the staphylococcus.

4. Acriflavine (dose, 0.2 Gm.), administered in capsules, exerts an antiseptic action in normal urine against both the colon bacillus and the staphylococcus, which is uniform and consistent to a surprising degree. Urinary alkalinity is essential.

5. Acriflavine (dose, 0.2 Gm.), administered in shellac-coated pills, is practically inert.

6. Acriflavine, administered in capsules, although noninjurious in efficient dosage, causes unpleasant symptoms (nausea and catharsis) in a fair proportion of cases.

7. Acriflavine, for the reason given, has its definite clinical limitations. Clinical experience indicates, however, that this drug is of distinct value in selected cases, particularly those of acute infections of the urinary tract.

CONCLUSIONS

As determined by antiseptic tests of samples of urine obtained before and after administration in unit maximum dosage to normal persons, pyridium is practically inert, caprokol is slightly antiseptic, methenamine is quite efficient and acriflavine (in alkaline urine) is unfailing.

In the treatment of infections of the urinary tract, the time has not yet arrived when the old reliable methods, based on detailed investigation and elimination of the accessory or underlying causes, may be discarded in favor of indiscriminate medication. It is likely that this statement will continue to be true long after our knowledge of the subject of internal urinary antisepsis has become more perfect than it is at the present time.

ABSTRACT OF DISCUSSION

DR. A. I. FOLSOM, Dallas, Texas: All urologists have suffered at the hands of overenthusiastic salesmen of urinary antiseptics. I am deluged with them repeatedly. I think that any opinion forced on the public should include a large number of cases treated absolutely the same. This is almost impossible, and yet these salesmen insist that because some man has treated his cases, others should adopt that preparation and give a testimonial. I cannot agree with the authors in weeding out entirely the question of pyridium. It does not follow because of the experimental work reported that pyridium will not have

a place as an antiseptic drug. I think I have seen some very good results in the clinical action in some instances. As to acriflavine hydrochloride, I have not given it up. I have always given methenamine first, and that is my judgment as to their relative value. I think there are two or three things about methenamine which are very important. One is the amount of the drug that is given. It must be used in large doses and given over twenty-four hour periods. Why are so many more cases of infection of the upper urinary tract seen in girl babies than in boys? This has been asked for years and there has been no explanation for it. In my judgment, the fact has been definitely established that there is a group of glands in the posterior portion of the internal urethra, and it is probably true that these little glands become infected during early infancy when the parts are contaminated by feces, which frequently carry germs from the upper respiratory tract into the open female urethra. They would be harmless if they did not find these little glands, where they set up an infection in the urine as it comes out, which is the normal protection from the infection. I have had this experience in many cases: A little child has fever, with pus in the urine. I have catheterized both ureters and to my surprise the laboratory report has been negative for pus from both kidneys, and yet the next day the child would have a definite change in the clinical picture. The temperature had dropped. In my judgment what had happened was that there was an inflammatory gland there in the urethra —because there is a double sphincter there—and the expansion of the urethra incident to the cystoscopy dilated the ducts sufficiently to drain them and relieve them of the posterior urethritis which was present, and not pyelitis. In women there is a red band running across from one ureteral orifice to another, as distinct as if painted with a brush. This is simply a lymphangitis which has extended up under the trigon, and it forms a base from which in later life reinfections of the pelvis continue to develop. This focus in the posterior urethra is one of the things to look for.

DR. H. W. E. WALTHER, New Orleans: While an antiseptic or bactericide is usually defined as an agent that destroys pyogenic organisms, at present internal urinary antiseptics are usually regarded as referring to substances which, when administered by mouth, tend to inhibit the growth of pathogenic bacteria in the urinary tract. So far no drug has been discovered that consistently rids the urinary tract of infection. The discovery of the ideal internal urinary antiseptic is still awaited. Methenamine by mouth has in my experience been most unreliable. This drug, when used intravenously, has been found of value in the preoperative preparation as well as the postoperative management of certain cases, but it has rigid limitations. For the past five years I have been submitting the pyridines and similar dyes to intensive clinical trial. I have used them to the exclusion of all other urinary antiseptics in a large series of cases simply to determine their therapeutic value. I feel that only by years of clinical study with a given drug is one qualified to evaluate its true place in therapy. After subjecting pyridium, mallophene and serenium to fair trial in more than 2,000 cases of urogenital infections due to all types of bacteria (exclusive of tuberculosis), I believe that the pyridine and kindred dyes are superior to the other antiseptics. In 1928, Dr. R. M. Willoughby and I reported on a clinical study made in 200 cases employing mercurochrome-220 soluble, gentian violet, acriflavine base, caprokol and pyridium. Our conclusions were that all of these drugs, with the exception of pyridium, were so irritating to the mucosa of the gastrointestinal tract or so innocuous as to be valueless. Before taking up our study with the pyridine group of dyes we did extensive work with acriflavine base. Most of our patients became so nauseated that they refused longer to take it. I feel the same today toward the future of chemotherapy in aiding in the quest of an ideal internal urinary antiseptic as I did five years ago. The pyridine groups of dyes probably undergo certain chemical changes during their passage through the body, so that the "pyridine eliminant" (in the form in which it appears in the voided urine) is an entirely different substance. If this contention is correct, the explanation as to why the authors failed to inhibit bacterial growth in voided urine containing the "pyridine eliminant" becomes clear. A word in regard to contraindications to the use of the pyridine dyes: In severe hepatitis with appreciable liver damage, demonstrable by means of a positive Ehrlich aldehyde reaction of the urine, these dyes should not be given. Again in chronic parenchymatous nephritis, with a low phenolsulphonphthalein output, they should not be prescribed. Lastly, there is a small group of patients who appear to have an idiosyncrasy to the pyridine group and who will not tolerate the smallest dose.

DR. I. G. DUNCAN, Memphis, Tenn.: Years ago I was urged to rid my patients of these foci of infection in order to relieve various infections in the joints and kidneys. I think this should be done in the interval between attacks. The patient should be placed in the hands of a urologist until the acute symptoms subside. The question of foci of infection can be gone into at a later date. My experience in removing the foci of infection has not been entirely satisfactory. In nearly every case, after the tonsils and teeth had been taken out and the sinuses corrected, the patient had just as much trouble as ever. Furthermore, an attempt to eradicate these foci in the acute attack is liable to cause an exacerbation of symptoms and make the patient very ill. I have seen patients in whom, the focus having been found in a tooth, would have chills, rigors and hematuria following its extraction.

DR. R. L. GORDON, New Orleans: I have used all types of urinary antiseptics, from pyridium on down the list. I have never seen any effect on the bacteriologic content of the urine. I think the best urinary antiseptic is water, and plenty of it.

DR. ANSON L. CLARK, Rochester, Minn.: I should like to emphasize that, in an aqueous solution, pyridium has a bactericidal effect. If a small amount of urine is added, the pyridium no longer has a bactericidal effect. My results have been exactly the same as those of the authors. May I ask as to the acidity of the urine when methenamine is given? The authors did not describe the acidity, but they mentioned the dose of methenamine. Methenamine does not have a bactericidal effect until the p_H of the urine is below 6, and that point has not been stressed sufficiently. In some cases observed in the Mayo Clinic in the last year a ketogenic diet has been prescribed, and it has been found that the ketone bodies in the urine, plus an acid urine, have a bactericidal effect. Among patients who have taken the drugs mentioned here, but whose urinary tracts nevertheless have not been rendered free from infection, it has been found that if a ketone urine can be produced of which the p_H is from 5 to 5.4, cultures of the urine will be negative in two out of three cases.

DR. M. L. BOYD, Atlanta, Ga.: I wish to discuss some cases which illustrate how difficult it may be to discover the cause of a urinary infection. A man, aged 28, with a persistent cystitis, was treated by a urologist for six months without improvement. I treated him for three months with courses of methenamine, caprokol, pyridium, acriflavine and a mixture of potassium citrate and tincture of hyoscyamus; the tincture of hyoscyamus mixture was the only thing that seemed to give any relief. In the meantime I was employing the other urologic procedures that might be of use. I had him examined by an internist and specialists. A few dead teeth were found but no other abnormality. I was sure that the cause of his trouble was outside the urinary tract so I had him see another internist, who concluded that he had an appendicitis. The appendix was removed and within two weeks the bladder symptoms were practically gone and the urine was clear, and he has remained well. Another patient with a chronic prostatitis had a gradual, almost complete, loss of vision in one eye and a partial loss in the other. Urologic treatments produced little improvement in the genito-urinary trouble and the ophthalmologists were not able to stop the gradual loss of vision. Nothing was found by internists and specialists to account for these troubles. But two years ago he had a sudden attack of intestinal disturbance and his appendix was removed and found to be subacutely and chronically inflamed and to contain three concretions. Since then the bacteria have disappeared readily from the urine, the prostatitis has cleared up, and there has been no further loss of vision. In another patient, a woman, there was a persistent infection of the left kidney and bladder without any demonstrable genito-urinary lesion to account for the continuation

of the condition. Examinations by internists and specialists did not disclose the cause of the urinary infection. All the well known urinary antiseptics were without curative effect. While under treatment she had an attack of urticaria which I thought might be due to the methenamine. I gave her suggestions about diet. The urinary infection did not improve and subsequent attacks of urticaria were worse than the first one. I had her tested for susceptibility to foods and found that she had a susceptibility to citrus fruits as well as to some other foods. On a restricted diet and no orange juice she has been free from symptoms for eight weeks and the urinary infection has cleared up.

DR. J. DELLINGER BARNEY, Boston: There seemed to be more cloudiness after six hours than after eight hours. I should like to know why that was. I agree with Dr. Gordon that the best antiseptic is water and lots of it, but I think that the drugs mentioned today have a certain place. I have tried out pyridium pretty carefully and found it of no particular value. I think that all have found that methenamine will help one patient and not another, and the same is true of pyridium and acriflavine.

DR. C. E. ERVIN, Danville, Pa.: Dr. Folsom has explained the frequency of urinary infection in children; at the same time, his explanation is not contrary to the finding that the infections frequently clear up when the tonsils are removed. As to Dr. Duncan's remarks, I do not doubt that there are times when every one becomes somewhat discouraged about the question of the removal of foci of infection. This is not always easily accomplished. For instance, the "pulling of teeth" is frequently a deceiving procedure, and without the cooperation of an oral surgeon who can appreciate the question of gingivitis, periapical dental infection and maxillary sinusitis of dental origin, the results will often be disquieting. Dr. Boyd's remarks serve to make one think beyond the urinary tract when studying these patients. As the result of continually asking "Why?" progress will be made. I, of course, work hand in hand with the urologist and would feel lost without him. So far as urinary antiseptics are concerned, I am sure they have done more harm than good. If a supposedly efficacious urinary antiseptic is placed in the hands of a physician who believes in it, he may be content to keep the patient on that treatment for weeks and weeks instead of having a thorough urologic examination.

DR. EDWIN DAVIS, Omaha: Dr. Clark inquired about the question of urinary acidity in connection with methenamine. I wish to state that these tests were carried out with no attempt to assure greater than ordinary urinary acidity. The urine was that of patients on an average diet and on average water intake. Doubtless if we had undertaken to increase the urinary acidity, the methenamine chart would have shown even greater evidence of antiseptic efficiency. Dr. Helmholz has done a great deal of work on the relationship between urinary acidity and antisepsis, and recommends ammonium chloride for this purpose. Dr. Duncan asks why, if these acriflavine pills color the urine, they are not effective. I cannot answer that but I can suggest a theory. Acriflavine is fluorescent, and therefore visible in exceedingly high dilution, which perhaps accounts for the color in the urine, in spite of only slight absorption from the intestinal tract. In this connection I referred only to the shellac coated pills. There are other types of enteric-coated acriflavine pills, concerning which I am not prepared to express an opinion at present. Dr. Ervin insists that these cases be carefully investigated without delay. Even if a standardized antiseptic drug were available (which it is not), such a drug could not be expected to cure stone in the kidney or bladder, or other trouble due to mechanical obstruction. After all the years I have put in on this subject, I regret to have to agree with Dr. Gordon and Dr. Barney regarding the efficacy of water and lots of it, which is the best urinary antiseptic now available. In this investigation I have attempted to answer one question only: Do certain drugs, administered in unit maximum dosage, cause normal individuals to secrete urine which is an unfit culture medium for ordinary bacteria, or do they not? I have made no attempt to evaluate clinical or laboratory investigation concerning the same drugs, done elsewhere.

ERYTHRODERMA PSORIATICUM

A REVIEW OF TWENTY-TWO CASES

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AND
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The term erythroderma psoriaticum is used to designate the generalization of psoriasis vulgaris to a point at which the usual clinical characteristics have disappeared and have been replaced by those of exfoliative dermatitis. Although this phenomenon is not understood in its entirety, its distinctive clinical character as contrasted with other types of exfoliative dermatitis is accepted. There is evidence, however, that even careful observers do not agree on all of its phases. This prompted us to make a complete review of our own material.

In somewhat more than 2,200 cases of psoriasis seen at the Mayo Clinic we were able to find 22 typical cases of erythroderma psoriaticum, an incidence of about 1 per cent. Ten of the patients were females and twelve were males. Various nationalities were represented, but nationality did not seem to be of significance. The earliest onset of psoriasis in this series was at the age of 6 years in one case, at 7 years in another, and from then on at almost any age until 57 years. The earliest onset of erythroderma psoriaticum was noted at the age of 19 years; it was then gradual up to the age of 60. The earliest onset of the condition after the beginning of psoriasis was given as 1 month. It seemed as though the complication had been part of the process from the beginning. The latest onset after the beginning of psoriasis was 34 years. In eight of the cases some degree of arthritis was associated, varying from very mild to very severe. This does not necessarily mean that the cases were of the psoriasis arthropathica type, as this condition is often determined with difficulty. One patient had had erythroderma psoriaticum continuously for eight years, and another for six years before they were seen by us.

As precipitating causes, arsenic internally and local irritating drugs or both seemed responsible in fourteen cases; an intercurrent infection seemed to be responsible in three cases and pregnancy in one case. In the remaining cases the precipitating factor was not known. In three cases a major physical disease was associated; in two nephritis was associated, but it did not seem likely that the nephritis influenced the course of the psoriasis directly, and in the third case severe cardiovascular disease with angina pectoris was present. The associated systemic disease probably did not affect the course of psoriasis. In ten of fourteen cases in which biopsy was obtained diagnosis was possible on microscopic changes alone; in two other cases the microscopic picture was sufficiently suggestive to aid in diagnosis. In the remaining two cases it was of no aid, and diagnosis was reached by continued observation. In nine cases treatment with such measures as colloid and sulphur baths, white precipitate, sulphonated bitumen, N. F., and borated ointments, calamine liniment, quinine, pills of ferrous carbonate, U. S. P., and autoserum required on an average sixty-one days to bring the skin to an approximately normal appearance. In twelve cases

From the Section on Dermatology and Syphilology, the Mayo Clinic.
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in which in later years crude coal tar and ultraviolet rays were used as treatment, an average of twenty-one days was required. In one case treatment was not consistent because of profound psychosis. In reply to a recent inquiry by letter as to the subsequent course of the disease of the skin, ten patients answered, some of them rather unsatisfactorily. Therefore, too much emphasis cannot be placed on these answers. It was apparent, however, that in the main the course had been about as expected. Five patients reported having had ordinary attacks of psoriasis with the usual remissions and exacerbations. Two had had more trouble with erythroderma; one had repeated attacks at irregular intervals for years, and the condition of the other had never entirely cleared. One patient was free from lesions of the skin to the time of her death from pulmonary tuberculosis about a year after treatment. Somewhat to our surprise one patient reported entire freedom from disease of the skin nine years after the attack of erythroderma, and another patient reported almost complete absence of lesions for six years.

COMMENT

Judging by our experience, erythroderma psoriaticum is somewhat uncommon. It is sufficiently common, however, to make its prompt recognition a matter of distinct practical importance; this has been further emphasized by a review of individual histories in our series. The psoriasis and the erythroderma which arises as a complication subsequently may begin at almost any time of life. The psoriasis does not necessarily have to be of long standing before the more serious problem arises, nor is the patient safe from erythroderma after a number of years. Psoriasis with arthritis probably does not predispose to erythroderma, but since arthritis occurs in about 30 per cent of these cases there may be a common factor in the two conditions. The incidence of arthritis in our series of cases of psoriasis is only about 14 per cent.

The clinical course of erythroderma psoriaticum varies materially; in an occasional case recovery is spontaneous, but the tendency is toward chronicity, without treatment, the condition lasting for years, rather than weeks or months. Patients are usually totally incapacitated socially and economically during the erythroderma period; therefore proper treatment is definitely more urgent than during the period of ordinary psoriasis. Diagnosis is not always easy. The usual characteristics of the psoriatic patch have disappeared, the nails may have become involved to a degree of deformity obliterating the typical pitting, or the pitting may never have been present. Often the history will be of little aid; in other cases the condition is unmistakable. Fortunately, the histopathologic picture remains that of psoriasis.[1] The parakeratosis and micro-abscesses may, however, not be so readily demonstrable because of the constant pronounced exfoliation of the corneal layer. Microscopic examination proved to be of positive value in twelve of fourteen cases in our series. In giving treatment in a case of ordinary psoriasis, the possibility of precipitating an attack of erythroderma should always be kept in mind. In almost two thirds of the cases reported here the condition seemingly was caused by treatment. Apparently the results of treatment of erythroderma psoriaticum by rest and various soothing measures are fairly satisfactory when continued over a considerable period. In our experience the treatment by crude coal tar and ultraviolet rays[2] was definitely superior to the measures we formerly employed. There is no way to predict the future course of the disease after disappearance of the erythroderma. In most cases the ordinary course of psoriasis evidently is retained; in some cases other attacks of erythroderma will appear in the future, but there is good evidence that in an occasional case the patient may remain practically free from trouble for years.

REVIEW OF LITERATURE

It seemed to us that it would help to clarify the nosologic status of erythroderma psoriaticum to compare our experience as embodied in this series of cases with some of the more notable opinions on this problem recorded in the literature. Crocker,[3] curiously enough, insisted that all forms of exfoliating dermatitis are of the same nature, including erythroderma psoriaticum with the others under the term pityriasis rubra, apparently not differentiating such malignant processes as the lymphoblastomas. This view can now readily be dismissed by merely quoting it. Török[4] is definitely more discriminating and calls attention to the difficulty of distinguishing the various forms of exfoliative dermatitis, and believes that the type secondary to psoriasis may be mistaken for pityriasis rubra of Hebra, especially the transition forms. Histologic examination will usually aid in reaching the correct diagnosis, and we have come to look on the tar and ultraviolet ray treatment as the equivalent of a therapeutic test. Hyde[5] stated that if psoriasis is extensive, it may lose its distinguishing features and assume all the characteristics both clinical and pathologic of exfoliative dermatitis. We and others have noted that the histologic characteristics of psoriasis are retained even then. Bowen,[6] in 1907, presented before the Boston Dermatological Society a man, aged 25 years, who for six years had been treated for psoriasis, with, among other agents, chrysarobin. The exfoliative dermatitis had developed two months before, and the patient was presented as showing an unusually obstinate psoriasis. The opinion of the members of the society was divided as to the origin of the exfoliative dermatitis. Chrysarobin was thought capable of producing such a condition, but it was also held that chronic psoriasis might spontaneously eventuate into exfoliative dermatitis. The experience in this case must always be reckoned with in almost any type of psoriasis. Chrysarobin among other local irritants may precipitate the complication, or the complication may come about spontaneously, but probably only seemingly so. Van Kerckhoff,[7] in his excellent monograph on psoriasis, repeatedly referred to this complication as though it were a terminal phenomenon, probably signifying more or less disintegration of the tissues of the skin. This view is somewhat misleading, as the histologic structure is usually retained in its essentials, and we have good evidence that with proper treatment[3] erythroderma psoriaticum may involute as promptly and as surely as psoriasis vulgaris. Patients

1. Gans, Oscar: Histologie der Hautkrankheiten, Berlin, Julius Springer, 1925, vol. 1, p. 287.

2. Goeckerman, W. H.: Treatment of Psoriasis: Continued Observations on the Use of Crude Coal Tar and Ultraviolet Light, Arch. Dermat. & Syph. **24**: 446 (Sept.) 1931.

3. Crocker, H. R.: Diseases of the Skin, Philadelphia, P. Blakiston's Son & Co., 1903.

4. Török, Ludwig: Die exfoliativen Erythrodermien, in Mraček, Franz: Handbuch der Hautkrankheiten, Vienna, Alfred Hölder, 1902, vol. 1, pp. 767-798.

5. Hyde, J. N.: A Practical Treatise on Diseases of the Skin, Philadelphia, Lea & Febiger, 1909.

6. Bowen, J. T.: Psoriasis Followed by Dermatitis Exfoliativa, J. Cutan. Dis. **25**: 314 (July) 1907.

7. van Kerckhoff, J. H. P.: Beiträge zur Kenntnis der Psoriasis vulgaris und ihrer Behandlung, Leipzig, S. Hirzel, 1929.

can remain free from a relapse for years, and occasionally it would seem as though following the complication the disease process might be less active than before.

Juliusberg [8] called attention to the difficulty of obtaining an antecedent history and a determination of the underlying psoriasis. He thinks that many cases in the literature reported as pityriasis rubra pilaris or exfoliative dermatitis of Wilson may be of the secondary type. We fully agree with him, but would like to emphasize that with reference to erythroderma psoriaticum such mistakes in diagnosis should seldom be made at the present time.

ABSTRACT OF DISCUSSION

DR. C. F. LEHMANN, San Antonio, Texas: The condition occurs about equally in males and females, and any age may be affected: Konrad has reported a case in a girl, aged 6 years. It may occur at any time during the course of psoriasis: the authors' case in which there was psoriasis for thirty-four years before the onset of erythroderma is outstanding. While local irritants and arsenic are sometimes ascribed as precipitating causes, cases are reported in which nothing could be ascertained as a precipitant. Bruns has reported such a case. The condition is not accompanied by any impairment in general health, and if there is any functional or organic trouble in a given case it is coincident and neither contributory to nor a sequence of erythroderma. The response to ultraviolet irradiation in as large a percentage as reported in the paper suggests a biochemical upset as responsible for the condition. This is further suggested by Konrad's experiment with grenz rays. He noted improvement in areas not irradiated and a fall of the white cell count from 16,000 to 9,600, with a decrease of eosinophilia from 12 per cent to 5 per cent on recovery. Ollendorf reported a similar experience in which the eosinophilia dropped to normal after irradiation of the thymus. Biopsy helps in the diagnosis of a large percentage of cases, and, with the therapeutic test with ultraviolet radiation, should be done in all cases. The means therefore exists of differentiating this condition from other forms of exfoliative dermatitis. The average duration of the disease in nine cases in this paper was sixty-one days on various treatments; and the average duration in twelve cases treated with ultraviolet radiation was twenty-one days. Berger, who states that the sun's rays should always be used as a test, quotes Dreyer as saying that the healing effect on the nails proves the general effect of the sun's rays. Itching is a minor symptom, whereas the itching in other forms of erythroderma is intolerable. I should like to ask whether this was true, as a constant characteristic in the cases reported here.

DR. HAROLD N. COLE, Cleveland: I should like to ask what relationship the authors think there is between erythroderma psoriaticum and pustular psoriasis, about which much is now appearing in the literature. During the last year I have had two cases of pustular psoriasis, both presenting arthritic symptoms, and I should like to know what the authors think is the relationship.

DR. FRED D. WEIDMAN, Philadelphia: Whenever one encounters cases of psoriasis that differ in any way from the normal, one should find out whether anything special is present that might have something to do with the etiology of that disease. Recently, in Havana, Dr. Ebert read a paper on pustular psoriasis and one of the things he inquired about was whether the presence of pustulation would throw any light on this point. The same thing is true when exfoliation features the case. An immediate illustration in point is a case of extensive diffuse exfoliation that has recently been found by Dr. Kittredge of Washington to be due to a fungus, and which had long been carried along under the diagnosis of chronic erythrodermia. He was prompted to examine this case for fungus because of its resemblance to an atypical tinea imbricata. Of course, when the latter occurs in the usual form it is obviously an imbricated tinea, but in some cases the imbrication is absent, just as the characteristic features of psoriasis were absent from the cases now under discussion. Of course, every one knows the parasitic theory of causation of psoriasis. I myself feel that psoriasis is not a local infectious condition but is of metabolic nature, and I do not believe that the cases now under discussion will yield any fungal structures. But at the same time they should be taken advantage of to inquire into that or any other factor.

DR. J. R. ALLISON, Columbia, S. C.: I am particularly interested in the treatment of psoriasis with the combination of coal tar and quartz light. At a meeting in Asheville six or seven years ago, I read a short paper on the treatment of psoriasis and other forms of scaly dermatitis by this method. I thought at that time that the results were due to some photosensitive reaction set up by the action of quartz light on coal tar. After the advent of the colorless tar extract I have used it more extensively in several of the scaly dermatitis conditions, but not with much success in psoriasis.

DR. CLARK W. FINNERUD, Chicago: I wish to question the advisability of putting these cases under a separate title. I have studied three such cases recently and whether the condition was universal, as it was in one instance, or partial, the cases were merely examples of dermatitis exfoliativa of the secondary type, and in these instances due to psoriasis. The suggested name does indicate the origin nicely, however.

DR. WILLIAM ALLEN PUSEY, Chicago: It has been stated that this is the largest reported group of cases of erythroderma psoriaticum, but dermatologists use this term in classifying cases. I question the advisability of the term. It is not accurately descriptive of the cases which the authors report. The term "erythroderma" means a process in which the inflammatory characters are at a minimum, and they describe cases in which a very definite inflammatory infiltrate is present together with psoriasis. I should like to see the cases described as psoriatic exfoliative dermatitis and not as an erythema. The authors state that most of the cases follow irritative treatment, usually arsenic. I would suggest that ultraviolet radiation may irritate and would put that among the possibilities of producing this condition.

DR. G. E. JOHNSON, Ardmore, Okla.: I should like to have the authors tell us the best and latest treatment for psoriasis vulgaris and the differential points between arthritis psoriaticum and erythroderma psoriaticum.

DR. RALPH HOPKINS, New Orleans: I should like to add to the group described by Drs. Goeckerman and O'Leary one case with an unusual history. It occurred in an old psoriatic patient with a disease of fifteen or twenty years' duration. The exfoliation was absolutely generalized, covering every part of the body, and within eight months the patient made a complete recovery. A striking feature was that after exfoliation the patient had apparently an absolutely normal skin; but the psoriasis recurred in about a year and she had another attack of exfoliative dermatitis. When she was last seen she had had six or more attacks of universal erythroderma psoriaticum.

DR. WILLIAM H. GOECKERMAN, Rochester, Minn.: I do not know whether I can answer all the questions, for Dr. O'Leary and I simply reviewed the twenty-two cases we had. Evidently the condition is rare, for in somewhat over 2,200 cases of psoriasis these were all we found. We have encountered eosinophilia repeatedly but I should not like to draw any deductions, because many skin diseases will cause eosinophilia. These cases unquestionably will present problems in diagnosis, as differentiation is difficult. The cases occasionally are pruritic. The erythrodermas seen in the lymphoblastomas are usually pruritic. One symptom will not make a diagnosis. The entire syndrome must be considered, and sometimes biopsy with many serial secretions, and the addition of a therapeutic method which I have advocated in the past, will permit of diagnosis in at least an occasional case. As to the crude coal tar and light therapy, I have been careful enough not to tie myself too closely to any particular opinion. I have done a lot of work with it myself and in association with others and I do not think I have solved the exact mechanism of how it works; but it does work. Dr. Finnerud spoke of this condition

8. Juliusberg, Fritz: Die Pityriasis rubra Hebrae, in Bumke, O.: Handbuch der Haut- und Geschlechtskrankheiten, Berlin, Julius Springer, 1928, pt. 1, vol. 7, p. 375.

as being placed under a separate head. That is a matter of personal choice, but these cases are not always readily classified when one is confronted with a condition secondary to psoriasis. From my standpoint I am willing to make a subclassification of these cases in order to convey what I mean. They are no longer cases of psoriasis and have not the features they had when psoriatic. The title seemed the best we could choose, but there may be a better one. Dr. Johnson brought up the question of treatment. My choice is crude coal tar and ultraviolet radiation. One of our cases was very similar to the one reported by Dr. Hopkins.

Clinical Notes, Suggestions and New Instruments

MONGOLISM IN THE NEGRO

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Mongolism in the Negro is probably not as uncommon as is generally believed. Instances of it are not always recorded. From time to time we have seen Negroes with the typical features of mongolian idiocy. Of four of these we have sufficient evidence to warrant presentation.

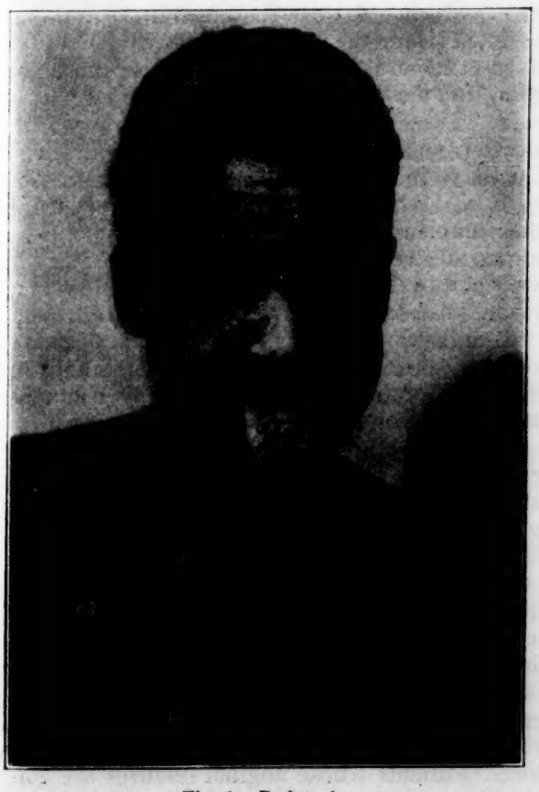

Fig. 1.—Patient 1.

CASE 1 (fig. 1).—A boy, aged 12½ years, was admitted to the Cincinnati General Hospital, Jan. 29, 1932. The father and mother of the patient were living and well, the former being 30 years of age and the latter 31 at the time of the patient's birth. A brother of the patient, aged 7 years, was living and well, and had no characteristics of mongolism. The mother had had five miscarriages and three children who died shortly after birth. The patient was the result of the first pregnancy and was delivered spontaneously at term, the mother being in eclampsia at the time. He had developed slowly, mentally and physically. His weight was 98¾ pounds (44.8 Kg.), his height 61½ inches (155 cm.), and the circumference of his head 20¾ inches (51 cm.). The somewhat slanting palpebral fissures, the well developed inner epicanthic folds, the ocular hypertelorism and the fissured, protruding tongue are shown in the illustration. No cardiac abnormalities could be made out on physical examination. The little fingers seemed short and were slightly incurved. The head was brachycephalic. The Wassermann reaction was negative. Roentgenograms of the skull and hands showed no abnormalities. An intelligence test gave a mental age of 3 years and 2 months and an intelligence quotient of 26.

Fig. 2.—Patient 2.

CASE 2 (fig. 2).—A girl, aged 3 years, was admitted to the Cincinnati General Hospital, Jan. 24, 1928. The father and mother of the patient were living and well. Their ages were not ascertained. Two sisters of the patient were living and well and had no characteristics of mongolism. The mother had had no miscarriages, but her first pregnancy resulted in a stillborn infant. The patient was the result of the second pregnancy and was delivered spontaneously at term. She could neither walk nor talk. Her weight was 21 pounds (9.5 Kg.). The palpebral fissures were somewhat slanting, the inner epicanthic folds well developed, and there was ocular hypertelorism; the tongue was usually protruding, the little fingers were short and incurved, the head was brachycephalic, and the fontanel was open. No cardiac abnormality was discovered. The Wassermann reaction was negative. Roentgenograms of the skull showed nothing abnormal; those of the wrists showed rickets.

Fig. 3.—Patient 3.

CASE 3 (fig. 3).—A girl, 9 days of age, was first seen by us on the day of her discharge from the obstetric service of the Cincinnati General Hospital, April 13, 1932. The father and mother of the patient were living and well, the age of the former being unknown and that of the latter 19 years. One brother of the patient was living and well and had no characteristics of mongolism. The mother had had no miscarriages. The patient was the result of the second pregnancy. Her weight was 5½ pounds (2.5 Kg.). The somewhat slanting palpebral fissures, the well developed inner epicanthic folds, and the ocular hypertelorism are shown in the illustration. The tongue was slightly fissured. There was slight incurving of the little fingers. No cardiac abnormalities were found. The Wassermann reaction on the mother's blood was negative. When seen at 2 months of age, the infant had all the somatic characteristics of mongolism.

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CASE 4 (figs. 4 and 5).—A girl, aged 7 years, was seen in the outpatient dispensary of the Cincinnati General Hospital, April 27, 1932. The father and mother of the patient were living and well, the former being 30 years of age and the latter 21 at the time of the patient's birth. There were two brothers, aged 11 years and 3 years, respectively, and one sister, aged 9

Fig. 4.—Patient 4.

years, all living and well and having no characteristics of mongolism. The mother had had three miscarriages. The patient was the result of the fifth pregnancy and was delivered spontaneously at term. She began to walk and talk at about 4 years of age. Her weight was 36 pounds (16.3 Kg.), her height 39 inches (98.5 cm.), the circumference of her head 19 inches (48 cm.). The slanting palpebral fissures, the ocular hypertelorism and the incurved little finger are shown in the illustrations. The head was brachycephalic. The tongue was decidedly fissured. There was a soft blowing systolic apical cardiac murmur. The Wassermann reaction was negative.

Fig. 5.—Hand of patient 4.

We have been able to find reports of eleven other cases of mongolism in the Negro. Bullard [1] recorded one, von Hofe [2] two, Davenport and Allen [3] two, Bleyer [4] three, Herrman [5] two, and Brahdy [6] one. In one of Bleyer's cases, remote admixture with white blood was admitted. Specific inquiry did not bring out this factor in any of our cases.

1. Bullard, W. N.: Boston M. & S. J. **164**: 56, 1911.
2. von Hofe, F. H.: Arch. Pediat. **39**: 737 (Nov.) 1922.
3. Davenport, C. B., and Allen, G.: J. Psycho-Asthenics **29**: 267, 1924-1925 (quoted by Brahdy).
4. Bleyer, Adrien: The Occurrence of Mongolism in Ethiopians, J. A. M. A. **84**: 1041 (April 4) 1925.
5. Herrman, C.: Arch. Pediat. **42**: 523 (Aug.) 1925.
6. Brahdy, M. B.: Arch. Pediat. **44**: 724 (Nov.) 1927.

Council on Physical Therapy

THE COUNCIL ON PHARMACY AND CHEMISTRY AND THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAVE AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE.

P. N. LEECH, Secretary,
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H. A. CARTER, Secretary,
Council on Physical Therapy.

OXYGEN THERAPY

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(Concluded from page 2033)

Anginal attacks are attributed to localized anoxemia of the heart muscle produced by a coronary circulation inadequate for the needs of the heart muscle at the moment, and are not associated with abnormally decreased saturation of the arterial blood as it passes through the lungs, and in consequence do not present the symptoms of cyanosis, without which oxygen therapy is rarely of benefit. However, a small increase in the amount of oxygen delivered to the heart can be obtained by the use of a high concentration, 80 or 90 per cent, which will raise the arterial saturation of the hemoglobin from the normal of 96 or 97 per cent to 100 per cent, and, in addition, increase the amount in solution in the plasma by approximately a similar amount. These additional amounts of oxygen, totaling about 8 per cent, may be just sufficient, in certain instances, to increase the oxygen pressure in the capillaries [54] of the heart muscle enough to prevent localized cardiac anoxemia and therefore stop or alleviate the pain and distress, as recommended by Barach,[55] by Rizer [56] and by Ulrich.[57] To obtain this effect in angina, one would use oxygen only during the attack (like amyl nitrite) and stop its use as soon as the attack was over; therefore, concentrations higher than those usually advised for prolonged oxygen therapy could be used with safety. For this purpose, a simple form of apparatus, such as the Haldane [14a] apparatus, consisting essentially of a rebreathing bag and mask such as are used in anesthesia, would be sufficient; with such an apparatus, oxygen could be made available at home without excessive cost and could often be manipulated by the patient himself. As emphasized by Henderson,[47d] a moderate amount of rebreathing will be helpful here on account of the possible beneficial effect which carbon dioxide will have on the circulation.

Oxygen therapy should be prescribed only for patients who are found subject to the type of anginal attack which could be relieved or ameliorated by such a procedure. Patients whose anginal seizures are controlled readily by rest, the xanthine drugs or nitrites probably do not merit oxygen therapy, but it is worthy of trial for patients whose attacks of angina are frequent, severe, and provoked by minimal effort, or which come when the patient is at rest.

It must be emphasized that oxygen therapy, as yet, has a limited application in the treatment of cardiac

54. That oxygen in high concentrations given to normal animals will increase the oxygen pressure of the blood in the capillaries has been shown in an ingenious way by J. A. Campbell (The Influence of Oxygen Tension in the Inspired Air upon the Oxygen Tension in the Tissues, J. Physiol. **60**: 20-29 [May] 1925).
55. Barach, A. L.: The Therapeutic Use of Oxygen in Heart Disease, Ann. Int. Med. **5**: 428-440 (Oct.) 1931.
56. Rizer, R. I.: Oxygen Treatment of Coronary Occlusion, Minnesota Med. **12**: 506-507 (Aug.) 1929.
57. Ulrich, H. L.: Angina Pectoris: Medical Treatment, Minnesota Med. **15**: 513-517 (Aug.) 1932.

disease. It should not in any way supplant other measures known to be valuable in combating acute heart failure, such as venesection, digitalis or morphine. The danger in its employment in states of chronic cardiac cyanosis, by destroying a compensating mechanism already established, has been considered earlier in this paper. However, subsequent studies may indicate its usefulness in conjunction with other therapeutic measures in a wider range of cardiac conditions [58] than is recognized at present.

In any type of chronic cyanosis, the withdrawal of oxygen treatment is difficult and of course must be gradual, to allow, if possible, redevelopment of the various compensatory mechanisms. This difficulty does not exist in acute cases of anoxemia if the oxygen therapy is continued until the cause of the anoxemia is completely, or at least largely, relieved. Barach [12c] has, however, called attention to the very serious reaction, which may be rapidly fatal, if oxygen treatment is withdrawn from a patient who without oxygen again rapidly becomes cyanotic. For example, it has been found unwise and even dangerous to stop oxygen therapy for a patient with marked pulmonary edema or pneumonia for long transportation to the x-ray room; if a roentgenogram is urgently needed, special arrangements are made so that the time during which the patient does not receive oxygen is limited to the minimum, and if the patient is very cyanotic some easily transportable emergency apparatus for oxygen administration, as used for anesthesia, is improvised for use during the transportation.

Asthma is a spasmodic contraction of the smaller branches of the bronchi, so that aeration of certain alveoli is interfered with, resulting in incomplete saturation with oxygen of the hemoglobin in the arterial blood. Pronounced hyperpnea may result from accumulation of carbon dioxide as well as from increased sensitivity of the respiratory center. In the majority of instances,[17] administration of oxygen will give prompt relief of the distress from the attacks, although it would have no direct influence on the cause of the attacks. Therefore, temporary administration of oxygen during an attack, either by the use of a tent or by a mask and rebreathing bag, such as that devised by Haldane,[14a] would be indicated until the spasm is relaxed by the aid of other therapeutic measures.

The dangers of oxygen therapy must always be kept in mind. They are of two kinds; the first is the danger of fire, and the second that of the ill effects produced by the use of too great concentrations.

There is also danger from a violent explosion of oxygen in the high pressure tank if it comes into contact with oil. Therefore, oil should never be put into or around the connections of reducing valves. If oil should accidentally be put on the reducing valve coupling, the entire valve should be sent to the manufacturer of the reducing valve to be cleaned, and he should be told what happened. Within the last few years a violent explosion occurred in one of the institutions of learning in this country from some such cause as this.

The danger of fire in oxygen chambers is much greater than in the use of oxygen tents and arises from two independent sources. One is from the presence in the chamber of electrical apparatus, with the danger of fire from sparks igniting oil or from the heating of bearings. Electric sparks can be prevented by rigid exclusion of all forms of electrical apparatus from within the chamber, and by efficient grounding of the chamber itself to prevent the accumulation of static electricity.

The other cause of danger from fire is greater, because harder to control, and is due to the taking of matches, lighted cigarets or pipes into the chamber. For example, an unfortunate and fatal accident once occurred because a person who was smoking a pipe before entering the chamber failed to put it out. He attempted to put it out by the usual custom of pressing down on the tobacco with the thumb and then sticking the pipe into his pocket. On entering the atmosphere of high concentration of oxygen in the chamber, the smoldering pipe burst into flame, igniting his clothes, which with the bedclothes became a raging fire almost instantly. The expansion of the gases by the heat then blew the chamber open. Staff physicians, house officers, nurses and visitors must be watched to prevent similar accidents. Matches should be removed from their pockets as a routine before they enter the chamber, to remind them of the dangers of fire. The nurses in charge of a chamber should receive specific instructions with regard to these dangers. It is obvious that the danger of fire is much less with the use of tents than of chambers.

The dangers incident to the use of too great concentration of oxygen were at first relatively small because of the inability in most of the older forms of oxygen tents, and even in oxygen chambers, of maintaining a dangerously high concentration of oxygen. However, with the improvement in mechanical equipment of both tents and chambers the danger is likely to increase, especially if one attempts to avoid the use of soda lime by the use of an excessive flow of oxygen. Paul Bert [59] originally showed that oxygen under pressure of 3 or 4 atmospheres was very poisonous to animals. Lorraine Smith showed that a pressure of less than 2 atmospheres caused a fatal inflammation of the lungs very rapidly and that 73 per cent could cause fatal pneumonia by a four days' exposure. Investigations on animals by Karsner,[60] by Barach,[61] by Binger, Faulkner and Moore,[62] by Faulkner and Binger [63] and by Campbell [64] have all shown that concentrations of oxygen in excess of 60 per cent (at sea level) are very injurious to pulmonary tissue and therefore should be rigorously avoided in the therapeutic administration of oxygen lasting more than a few hours. All the experiments of this nature have been carried out at or near sea level, and under these conditions the upper limit of safety can be taken as about 60 per cent, which, expressed as the partial pressure of the oxygen, would be approximately 450 mm. (760 × 60 per cent). Since the time of Paul Bert

58. Barach.[55] Barach, A. L., and Richards, D. W., Jr.: Effects of Treatment with Oxygen in Cardiac Failure, Arch. Int. Med. **48**: 325-347 (Aug.) 1931. Hamburger, W. W.; Katz, L. N., and Rubinfeld, S. H.: Clinical Observations on Oxygen Therapy, Tr. A. Am. Physicians **46**: 357-359, 1931. Harrop, G. A.: The Oxygen and Carbon Dioxide Content of Arterial and of Venous Blood in Normal Individuals and in Patients with Anemia and Heart Disease, J. Exper. Med. **30**: 241-257 (Sept.) 1919. Levy and Barach.[58] Resnik, W. H.: Observations on the Effect of Anoxemia on the Heart: I. Auriculoventricular Conduction, J. Clin. Investigation **2**: 93-115 (Oct.) 1925; II. Intraventricular, ibid. **2**: 117-123 (Dec.) 1925; III. Changes in the Auricles with Particular Reference to the Relationship Between Anoxemia and Auricular Fibrillation, ibid., pp. 125-141. Sands, Jane, and DeGraff, A. C.: The Effects of Progressive Anoxemia on the Heart and Circulation, Am. J. Physiol. **74**: 416-435 (Oct.) 1925. Thalhimer, William: When is Oxygen Therapy Indicated and How is It Best Given? Mod. Hosp. **38**: 105-116 (Feb.) 1932.

59. Bert, Paul: La pression barométrique, Paris, G. Masson, 1878.

60. Karsner, H. T.: The Pathological Effects of Atmospheres Within Oxygen, J. Exper. Med. **23**: 149-170 (Feb.) 1916.

61. Barach, A. L.: The Effects of Atmospheres Rich in Oxygen on Normal Rabbits and on Rabbits with Pulmonary Tuberculosis, Am. Rev. Tuberc. **13**: 293-316 (April) 1926.

62. Binger, C. A. L.; Faulkner, J. M., and Moore, R. L.: Oxygen Poisoning in Mammals, J. Exper. Med. **45**: 849-864 (May) 1927.

63. Faulkner, J. M., and Binger, C. A. L.: Oxygen Poisoning in Cold Blooded Animals, J. Exper. Med. **45**: 865-871 (May) 1927.

64. Campbell, J. A.: Further Observations on Oxygen Acclimatisation, J. Physiol. **63**: 325-342 (Sept.) 1927.

it has been recognized that not only chemically but also physiologically the effect of a varying quantity of a gas is dependent on its partial pressure and not on its percentage composition in relation to other gases. It is necessary to use higher percentages of oxygen in high altitudes to obtain the same partial pressure. That is, at an altitude of 10,000 feet the barometer would be about 550 mm. instead of 760 mm., and 80 per cent of 550 would be about 440 mm. (neglecting water vapor), or less than the 450 mm. partial pressure that would result at sea level from the use of 60 per cent oxygen. It is necessary to call attention to the fact that it is dangerous to use oxygen for any great length of time in excess of 450 mm. partial pressure, and that this figure is the same at sea level or in the mountains; this pressure will correspond to about 60 per cent concentration at sea level, and to about 80 per cent concentration at an altitude of about 10,000 feet.

Robertson, in the pathologic meetings of the Mayo Clinic, has called attention to the fact that frequently patients who have had oxygen treatment and die with pneumonia may present evidence of more extensive pulmonary involvement than patients not so treated. He emphasized that the probable explanation for this apparently unfavorable result is not that the oxygen produced this more extensive involvement but rather that the patient was kept alive longer and survived the development of more extensive lesions than if he had not been treated with oxygen. Likewise, Barach,[61] has found that animals with experimental pulmonary tuberculosis could be kept alive longer if treated with oxygen than if not so treated; there was, however, greater pulmonary involvement of those treated with oxygen than of the controls; he interpreted these results as being chiefly due to prevention of death for a considerable time by the fact that the oxygen prevented the ill effects of anoxemia from becoming manifest at as early a period of pulmonary involvement. Nevertheless, as emphasized by Haldane, it is possible that a lung already inflamed may be extraordinarily sensitive to high oxygen pressure; therefore, pressures in excess of 450 mm., corresponding to 60 per cent at sea level, should be rigorously avoided.

In conclusion it can be emphasized that oxygen therapy, properly administered, has been found to be of marked benefit, and often even a life-saving measure, in nearly all cases of acute anoxemia. In acute anoxemia, therefore, regardless of the primary cause of the anoxemia, oxygen therapy is recommended as a valuable therapeutic and alleviating measure.

ADMINISTRATION OF OXYGEN

In spite of sound physiologic grounds for the use of oxygen in anoxemic conditions, until recently the results of its attempted application have been unsatisfactory and expensive, largely because of improper methods of administration.

The following suggestions for administration of oxygen must, of course, be in general terms so as to apply not only to the new, improved types of tents, but also to the older models which are in use in many places and are still rendering good service. Thalhimer has also given a detailed description of the methods of administration.

The best possible results from oxygen therapy are to be obtained by the use of oxygen chambers in which the patient has all the bodily comforts, without impairment of nursing efficiency; however, a consideration of their construction and operation is beyond the scope of this article.

Today, excellent results can be obtained from use of the recently improved models of oxygen tents, if they are properly run by experienced persons. Not only is it necessary to know how to run the oxygen tent, but it is incumbent on the supervisor of nurses in each hospital to instruct her student nurses in the method of caring for the patient efficiently, and, at the same time, in such a way that the concentration of oxygen is consistently maintained. It is permissible, however, once or twice a day, completely to change the patient's bedding and to carry out other manipulations if necessary; such procedures should be done as rapidly as possible, by two nurses working together when practicable and with everything needed already at hand. Fluids and liquid diet can be given through a sleevelike opening in the side of the tent, without much loss of oxygen, by an experienced nurse and a cooperative patient. Irrational patients are, of course, much more difficult to manage in a tent.

The concentration of oxygen in the tent, at or near the sea level, should never exceed 60 per cent and should preferably be maintained as close to 50 per cent [65] as possible. This is a concentration approximately two and a half times that of natural air. Rarely, at sea level, have concentrations higher than 50 per cent been found of value. While this may sometimes be due to the fact that higher concentrations are in themselves injurious to pulmonary tissue, it is more probable that, if the pulmonary edema and pneumonia are so extensive that cyanosis cannot be prevented by a concentration of 50 per cent, the disease has progressed beyond the stage at which it can be controlled; conversely, concentrations of less than 45 or 50 per cent rarely completely control the cyanosis, even in the early cases. Further, there is no particular advantage in maintaining a borderline concentration, which might be sufficient for a few patients but would be insufficient for a larger number, especially as no practical means are available for easy and rapid distinction between them.

Analysis of the concentration of oxygen should be made three or four times daily, and the result recorded either on the temperature chart or on a separate oxygen therapy sheet. The advantage of a separate sheet for recording the details of oxygen therapy is obvious if it is desired to make a study of the beneficial effects produced. If the concentration is found below that desired it should be elevated, and the cause of the low concentration should be remedied and also noted on the chart; the cause is usually improper tucking in of the skirt of the tent, on the assumption that there are no holes [66] in the tent cloth and that the oxygen is flowing in properly. When regular analyses are made it is possible to adjust the flow of oxygen from the tank at such a rate that the concentration in the interval between analyses can be kept fairly constant if proper attention is directed to keeping the skirt tucked in; a neatly arranged skirt may be poorly arranged as far as keeping in the oxygen is concerned.

65. While 50 per cent is about the correct percentage concentration for oxygen at sea level, 70 or 80 per cent will be needed in high altitudes, because, as pointed out elsewhere, the physiologic value of oxygen or any gas depends on its pressure. The correct average percentage concentration for any altitude can be determined by multiplying 50 by 76 (the average barometric pressure in centimeters of mercury at sea level) and dividing by the average barometric reading in centimeters of the locality. If the local barometer is expressed in inches, 50 should be multiplied by 30 and the product divided by the average barometric pressure in inches.

66. In the best types of tent hoods, the needle holes made in sewing the cloth together are filled with glue and covered by an extra layer of tape so that there is little loss by diffusion; the extra cost of this precaution will be more than repaid by a larger saving in oxygen. As soon as the rubberized fabric begins to crack and contains even a few breaks of pinhole size which can be determined by holding it up to the light, a new hood should be procured, for it will shortly more than pay for itself.

It should be possible to maintain an average concentration of oxygen of approximately 50 per cent in a tent properly constructed and operated, by the use, on the average, of a little less than one standard tank daily unless the patient is restless or needs much attention, requiring the opening of the tent. A standard tank of oxygen, at the shipping pressure of approximately 2,000 pounds to the square inch, contains 220 cubic feet of oxygen, or 6,230 liters, and will last about twenty-four hours if the outflow is at the rate of 4.3 liters per minute. The cost of a tank of oxygen varies somewhat, and hospitals which use large quantities can naturally obtain better prices by buying on contract than can those which use only an occasional tank. The cost of a tank of oxygen containing 220 cubic feet will therefore vary from about $2.75 on large contracts to $4.40 for single tanks, without including freight charges or the original price of the cylinder. The freight charges will vary in different localities, depending on the distance from the nearest plant, as well as on the shipping facilities. Emergency delivery, of course, costs much more than regular shipments. On account of the cost of oxygen, the skirt of the tent must be kept in good condition to prevent leaks, and, as mentioned before, must be properly tucked in around the patient and opened as infrequently as possible; it must be reiterated that the combination of economy and administration of an efficient and practically constant concentration of 50 per cent oxygen can be obtained only by frequent analysis and entering on the patient's temperature chart or special oxygen treatment sheet a record of the results as found, and also, if the concentration has been found too great or too small, after correction has been effected, a note should be made of the cause of the improper concentration of oxygen.

The carbon dioxide given off with each expiration must be removed from the air circulating in the closed circuit system. If this is not done, the concentration of carbon dioxide will rapidly increase above the desired upper limit, which for most patients is about 1 or 1.5 per cent. If the concentration further increases above this figure, breathing will become progressively deeper and then will become unbearable and finally dangerous, around 4.5 to 5 per cent. The carbon dioxide is effectively and economically removed by the use of soda lime, which is placed in a separate compartment of the circulating air current on the same principle as that on which soda lime is used in the closed circuit type of basal metabolism apparatus. However, removal of carbon dioxide need not be complete in the oxygen tent. The soda lime container must be provided with a separate basket for the soda lime so that it can readily be removed for renewal, and it should not be larger than is necessary for twenty-four hours' use. It is permissible to allow the concentration of carbon dioxide to be around 1.5 per cent, as that percentage will not cause respiratory discomfort. However, a concentration of 1 or 1.5 per cent carbon dioxide is sufficiently great to act as a moderate respiratory stimulant and to increase somewhat the depth of the respirations. It may at times be desirable to allow the carbon dioxide to increase to 2 per cent or occasionally to 2.5 per cent, but caution must be used with the higher concentration and distressed respiration should be avoided. To regulate the carbon dioxide in the tent to the desired concentration, there should be a valve by which more or less of the circulating air can be shunted around the soda lime. Such a valve should be so constructed that the amount of circulating air going through the soda lime container can be varied so that the sum of the factors which remove carbon dioxide will produce the desired concentration of carbon dioxide in the tent. The patient will form sufficient carbon dioxide himself easily to raise the concentration of carbon dioxide inside the tent to a level sufficiently high to increase the depth of respiration if the hood of the tent is carefully tucked in, and if the flow of oxygen is less than 5 liters per minute. Therefore, it is unnecessary to introduce pure carbon dioxide from a tank; in fact, this should be done only by those well conversant with the effects produced, because a concentration could readily be produced which would be harmful and even dangerous.

The length of time during which soda lime[67] will remain efficient will depend in part on the rapidity with which the patient forms carbon dioxide. This rate of formation of carbon dioxide is, however, only one factor influencing the length of time during which soda lime will remain efficient. The other chief factor is the rate of supply of oxygen. Even a large patient, with a high metabolic rate, will not exhale much more than 500 cc. of carbon dioxide per minute. In order to maintain the concentration of oxygen at approximately 50 per cent, it was rarely possible with the older models of tents to use less than 6 or 8 to 10 liters per minute, while with the newer models the concentration can be maintained with 3 or 4 liters per minute, and under ideal conditions even with 2 liters per minute. Of course, the greater the waste of oxygen the more carbon dioxide is washed out of the tent and the less rapidly is the soda lime used. It is this wasteful use of oxygen, as shown by Rosenblüth and Block,[68] that has led to the idea that it is not necessary to use soda lime; it is true that soda lime need not be used if sufficient oxygen is wasted, but it is far more economical to use soda lime than to waste oxygen. It is impossible to state how long a given filling of soda lime will last. It has been found that the best practical test is to change the soda lime when the carbon dioxide in the tent rises above 2 per cent, provided the by-pass valve is so turned that all the air current is passing through the absorber. An increase of depth of respiration is a warning that carbon dioxide is accumulating; very deep breathing and labored respiration indicate that the concentration of carbon dioxide is at a dangerous level. If the soda lime has to be renewed while the tent is in use, the motor should be stopped and the soda lime basket removed from its container. The motor can then be started again while the soda lime is being renewed; of course the motor should be stopped, when the basket is being put back into its container, to prevent loss of oxygen.

In the newer models of tents the hoods have been made much larger and the cooling system so improved that the patient is even more comfortable in a tent than out, especially in warm weather. The skirts of the hoods in the new models are, as mentioned, better constructed, and they are cut in such a manner that they can be tucked in much better around the patient and the mattress. The net result of the recent improvements is that after the concentration of oxygen has been raised to 50 per cent it frequently can be maintained

67. Soda lime, if very dry, will not absorb carbon dioxide; therefore, it is sometimes advisable to moisten it somewhat when first starting up the tent. After the tent has run for a period, the soda lime will be automatically moistened by the moisture in the expired air. Of course, care must be taken not to make the soda lime too moist or to put sufficient water on the soda lime so that it will run into the air pump. No free water should be visible; the soda lime should not be pasty; it should, for greatest efficiency, be just not "bone dry."

68. Rosenblüth, M. B., and Block, Morris: Oxygen Therapy Without Soda Lime, J. A. M. A. **98**: 396-397 (Jan. 30) 1932.

there by the use of only 3 liters per minute, and occasionally by 2 liters per minute, although it cannot be taken for granted that the proper concentration will be maintained by 2 or 3 liters per minute unless regular and frequent analyses are made. This ability to use less oxygen has reduced the cost of oxygen therapy to almost one half of what it was with the older models, and also it is possible to build up as high a concentration of carbon dioxide as is necessary to obtain increase in the depth of the respiration, as is sometimes desirable.

In tucking in a tent hood, especially these larger types of hoods, it must not be forgotten that a mattress is very pervious to oxygen. Therefore, the upper half of the mattress should be covered with a rubber sheet, large enough to tuck in at the sides and top end. The large tent hoods should then be tucked in under the mattress at the head end and at the upper part of the sides. The lower flap should be tucked in tightly and smoothly over, around and partially under the hips so that the patient can move his legs slightly without producing a leak. Frequently, in addition, a draw sheet placed across the pelvis and tucked in under the mattress at both sides is a help in keeping the lower flap in position. Economy in obtaining proper concentrations of oxygen depends largely on the skill and care with which the hoods of the tent are tucked in around the patient and mattress, and also on whether or not the tent hood is well made of nondiffusing material, and is in good condition. Little differences in the method of tucking in must be made for different types and designs of the various tent hoods. With an efficiently tucked in hood, an oxygen concentration of 50 per cent, with a cooperative patient, can be maintained easily by the use of from 3 to 4 liters per minute; under ideal conditions, 2 liters per minute is sufficient. On first getting a tent, the person responsible for oxygen therapy in an institution should use a normal subject and after putting a rubber sheet and draw sheet over the upper half of the mattress should learn how to tuck in the tent hood by repeated trials, and by making analyses for oxygen with the flow set at 2, 3, 4 and 5 liters per minute after the concentration has been raised to 50 per cent by about five or ten minutes of a rapid flow of oxygen through the by-pass. The time needed to raise the concentration to 50 per cent for each make of tent should also be determined by the user.

Three methods can be used to make the air circulate through the soda lime box for absorption of carbon dioxide and over the ice in the refrigeration box for cooling the air and decreasing its humidity.

The best method is to circulate the air by a rotary blower driven by means of an electric motor. When an electric motor is used it is a simple matter to vary the rate of the current of air by varying the speed of the motor by means of a rheostat. The rheostat should be an integral part of the apparatus and attached to the tent support at some convenient place. In order to avoid noise, a rather large pump and motor are sometimes used with the intention of keeping the speed of the motor rather low. Not infrequently the electric blower, if run at full speed, may create enough pressure inside the circulating system so that, at least in some of the earlier forms of apparatus with long pieces of rubber tubing in the circuit, the 2 to 4 inch water seal in the trap of the icebox is blown out; if the water seal breaks, of course, the circulating air with its extra oxygen is blown out into the room and a corresponding amount of air from the room is sucked in around the skirt of the tent; such a condition reduces greatly the concentration of the oxygen and is very wasteful. Attention must always be directed to seeing that this state of affairs is avoided, and it can be done by placing the hand under the opening of the ice trap; if air is blowing out, the speed of the motor should be decreased. In the newer models of tents, this difficulty has been remedied. Also, in first starting up the tent one must see that enough water (about a glassful) is in the icebox to fill the water trap. Another difficulty is that sometimes the drain pipe gets stopped up with dirt and slime from the ice, and water backs up in the ice-chest above the opening for circulation of the air, thus stopping all circulation; drain pipes and trap must be so constructed that they can be easily removed for cleaning. If the drain pipe has a shut-off valve, this must be opened after the ice is put in and before the tent is started; occasionally this is forgotten and, of course, as the water collects, will stop the circulation of the air.

Both the electric motor and the air pump should be placed in a convenient place so that the brushes can be readily replaced when worn out or other adjustments made. The motor bearings as well as the pump bearings, if the latter are separate, must be so situated that they are readily oiled and any needed adjustments easily made.

A less efficient and more expensive method of making the air circulate is to use an injector actuated by the compressed oxygen. It is possible to regulate the rate of circulation of air to a limited extent by varying the amount of oxygen going through the injector by an appropriately constructed valve. For use where electricity is not readily available, this simple device is excellent. The injector method has the disadvantage of introducing oxygen into the tent by two separate routes, and both must be taken into consideration in estimating the amount needed for maintaining the desired concentration in the tent. The amount of oxygen going into the tent through the injector is variable, as it is changed to alter the rate of circulation of air (unless the unsatisfactory alternate is used of not being able to vary the rate of circulation and thus greatly limit the ability to control the temperature and humidity within the tent); consequently, the amount of oxygen supplied through the regular oxygen supply feed must be changed inversely to the amount used for circulating the current of air, and the sum of these two variable supplies of oxygen will be the amount of oxygen introduced into the tent. Clearly, under these conditions, it is difficult and sometimes impossible to know the total amount of oxygen that is being used per minute, as it is impossible to use a flow meter. Furthermore, an injector will require about 6 liters of oxygen per minute to produce even a moderately rapid circulation of air, and the rate is usually insufficient to reduce the temperature and humidity in the tent as much as is desirable in hot weather. As has been pointed out, even 6 liters per minute is considerably more oxygen than is necessary to use in the newer models. Therefore, this method of circulating the air can be recommended only for places where electricity is unavailable.

The third method for circulating the air through the apparatus is to make use of the convection currents produced by the ice cooling the air. This method has the advantage of extreme simplicity and low cost of construction. The range of temperature and humidity control is naturally less than can be obtained by a circulation of air produced by a motor-driven air pump.

The supply of oxygen from the high pressure oxygen tanks [69] is reduced to a comparatively low pressure by means of standard reducing valves, which are equipped with a high pressure gage to show the amount of oxygen in the tank; a low pressure gage is frequently added to show the reduced pressure. The flow of oxygen is then better regulated by means of a simple needle valve attached directly to the low pressure outlet than by utilization of the regulator on the reducing valve; with this arrangement the reducing valve should be set permanently to correspond to a low pressure of about 30 pounds. The quantity of oxygen per minute is easily determined by a flow meter, the most inexpensive form of which is to bubble the oxygen through a water bottle calibrated so that the first hole will deliver 2 liters per minute, each succeeding hole either 1 or 2 more liters, and so on up to 10 liters per minute; the bottom of this tube is open in order to allow a more rapid flow and thus to render it possible to raise the oxygen concentration rapidly to the desired level when the tent is first put on or after it has been opened to give attention to the patient. Or, better, as in some forms of apparatus, a by-pass is arranged for rapidly increasing the oxygen content of the tent without going through the flow meter, the capacity of which may be limited. A water gage is an inexpensive form of flow meter and if kept clean does not get out of order; it is sufficiently accurate to meet the requirements. There are other excellent forms of visible flow meters, which, however, are somewhat more expensive. An unsatisfactory method of measuring the rate of flow is a low pressure gage [70] calibrated in liters.

The icebox on the older models of tents was not insulated and therefore very inefficient. All the newer models have larger iceboxes, of better construction, which are well insulated. The circulating air, driven by a rotary blower (or an injector) passes over and through the ice [71] in the icebox. The refrigeration accomplishes two distinct purposes: first, it cools the air, and, second, it removes the moisture from the air given off by the patient in the same way as the moisture of one's breath is condensed out on a cold window pane. The newer models of tents, especially those which allow the air to pass directly from the icebox into the tent without the use of long pipes, are highly efficient in their cooling properties. In fact, it is possible to develop with a normal subject a temperature inside the tent as low as 62 F. with a room temperature of 80; under these conditions the humidity is also so low that the patient must be protected from overcooling by decreasing the rate at which the air is circulated. The great advantages obtained by the recent improvement of the new models lie in their greater cooling power and in the use of larger tent hoods, both of which factors contribute greatly to increase the comfort of the patient, while at the same time reducing the amount of oxygen used by decreasing the restlessness of the patient and thereby greatly reducing the expense.

Every tent should have a conveniently arranged small outlet and valve (or clamp) with a rubber tube attached to lead to the buret of the analyzing apparatus so that the sample of the air in the tent can be easily obtained for analysis.

As has been emphasized repeatedly, analysis of the air which the patient is breathing must be frequently made. Analysis of the oxygen should be made at least three times daily and the result recorded on the patient's temperature chart or on a special oxygen therapy sheet. The analysis of carbon dioxide can be made less frequently immediately after putting in new soda lime if the circulating air is passing through the absorber. Both, however, should be done much more frequently when the tents are being run by inexperienced persons and the frequency decreased as they become better acquainted with the manipulations necessary to obtain the desired concentration.

It is therefore necessary to purchase with the tent a suitable apparatus for analyzing both the oxygen and the carbon dioxide. When several tents are in operation in one institution, the analyzer can be carried from tent to tent if so desired and if the local conditions are such as to render this procedure practicable. Most manufacturers of tents now sell a suitable apparatus for analyzing both oxygen and carbon dioxide and supply with it complete instructions as to the method of making such analysis, so that it is unnecessary to give those details here. Repeated, accurate analyses are of such importance that I once more reiterate the recommendation that they be made as a routine not less than three times daily.

It seems hardly necessary more than to mention the necessity for adequately washing with soap and water the inside and outside of the tent hoods after they have been used.

If an oxygen tent is not available a temporary emergency type of apparatus can be made, consisting of an anesthetic mask with rebreathing bag. The Haldane apparatus is such an arrangement and is particularly well adapted for emergency use of oxygen. His apparatus proved very serviceable during the war.

Another emergency method is the introduction of a catheter through the nose, with the open end in the oropharynx at the level of the uvula. To prevent drying of the mucous membrane the oxygen should be passed from the reducing valve through a water bottle, in which, by means of fine holes or wire screening, the stream of oxygen is broken up into fine gas bubbles, so that the gas is saturated with water vapor. From this bottle the oxygen should pass through a regular water flow meter, so that the quantity supplied may be easily measured. The flow required for an adult will be between 6 and 10 liters per minute. From the flow meter the oxygen should pass through another bottle to act as a trap to prevent actual liquid water from being forced into the patient's oropharynx. In addition, either a water or a mercury safety valve should be placed in the circuit to prevent the building up in the patient of a pressure exceeding a few centimeters of water. A fatal result could easily occur if the catheter got pushed down into the esophagus and the stomach blown up.

Neither the mask nor the catheter is as efficient as the oxygen tent, nor nearly as comfortable, and therefore should be used only when the tent is not available.

69. Oil should never be used around a high pressure oxygen cylinder and its reducing valve. As mentioned earlier in considerable detail, the use of oil in conjunction with oxygen under high pressure may result in a violent explosion.

70. The manufacturers of reducing valves have attempted to calibrate their low pressure gages in terms of liters per minute instead of in units of pressure. While such a calibration is usually accurate when the pressure gage is new, it often does not remain so after prolonged use. I had several of these volumetrically calibrated pressure gages on different machines, and after several months of use unsatisfactory results were being obtained; therefore, they were tested by a meter and I found in a series of ten so tested that when set to deliver 6 liters each minute I obtained variations in flow from an extreme low of 1 liter per minute to a high of 30 liters per minute. Since then I have not dared to use pressure gages for the quantitative measurement of flow of oxygen.

71. If "dry ice," that is, solidified carbon dioxide, is used, the dry ice must be placed inside the refrigerating box in a separate container. As dry ice melts it liberates a large amount of carbon dioxide, which must be conducted to the outside by a special vent pipe; if the carbon dioxide is allowed to pass into the circulation, it would quickly use up the soda lime. In districts where dry ice is readily available, this makes an excellent refrigerant if the apparatus is so constructed as to permit of its use.

An ideal miniature oxygen chamber for new-born babies or older infants can be made easily by soldering on a water seal about 1½ inches wide and 2 inches deep around the top of a Hess incubator and providing a new top with glass windows, through which the baby can be observed, and with a flange to go into the water seal. The cover should be provided with two short copper tubes about one-fourth inch in diameter, to one of which the oxygen inflow tube can be attached and to the other a rubber tube to go to the analyzing apparatus. The manipulation is simple: after the baby is placed in the incubator and the top closed, oxygen is allowed to flow in rapidly until the concentration is around 40 or possibly 45 per cent. After a few trials the time required to do this can be estimated accurately but should always be controlled by analysis. Tests have shown that as the infant uses so little oxygen, no appreciable decrease in concentration will occur during the interval between feedings if the apparatus has been made tight; likewise, the concentration of carbon dioxide will not materially increase.

Council on Pharmacy and Chemistry

REPORTS TO THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

P. N. LEECH, Secretary.

"TONIKUM"-ROCHE NOT ACCEPTABLE FOR N. N. R.

[The following report of the Council on Pharmacy and Chemistry on Tonikum-Roche was authorized for publication at the same time that advertisements appeared in the pharmaceutic press stating that "The name of the new 'Roche' tonic TONIKUM has been changed to Elixir Arsylen Compositum." There has also been received in the office of the Council a catalogue on Roche medicinal preparations in which there is listed Elixir Arsylen Compositum "Roche" (Formerly Tonikum).]

The phrase "Medicine of rare quality" appears on the trade package of Tonikum-Roche (Hoffmann-La Roche, Inc., New York). This product is a regrettable throwback to the days of "shotgun" proprietaries marketed under names devised to advertise their intended therapeutic use. From the standpoint of rational therapeutics, the more "rare" such preparations as Tonikum are, the better for the medical profession and for the public.

On the trade package, Tonikum is stated to contain in each fluidounce "Ext. Kolae glycerinat. saccharat. 'Roche' equiv. Sem. Kolae gr. 90; Arsylen 'Roche' (Natrium allylarsonicum) gr. ¼; Ext. Nucis Vomicae gr. ⅓; Natrium biphosphoricum gr. 18; Manganese gr. ⅓₀; Elix. Aromat. 'Roche' q. s. Alcohol 3½%." The dosage is given as one to two teaspoonfuls three times a day. The preparation is offered as a "well-balanced tonic remedy for the stimulation of metabolic activities containing reconstructive agents of demonstrated value. . . ." Neither "Tonikum" nor "Arsylen," stated to be its "most important energizing constituent," has been presented for consideration of the Council; but this is not necessary for their appraisal.

The advertising for Tonikum runs true to the classic "shotgun" type. Claims are made for the value of each constituent and then clinched with the general statement that they are combined "in small but properly balanced dosage, for ideal effect," implying that every patient evidently needs just these remedies in just these doses; and skeptics are reproved with the slogan, "With 'Roche' on the label you may feel confident of a good tonic"; so why take the trouble to think further?

Arsylen, the featured constituent, is stated to have advantage over the cacodylates in that it is "readily oxidized and its therapeutic influence is asserted promptly." It is claimed that the drug "exerts its beneficial influence in all asthenic conditions, in blood deficiencies, and in the loss of appetite and vigor." Since there appears to be no extensive or important clinical evidence for the advantage of "Arsylen" as a "tonic," there is no good reason why physicians should use it instead of solution of potassium arsenite (Fowler's solution), when the effects of arsenic are desired. According to the label statements of dosage and composition, the patient taking Tonikum would receive but 3/32 to 6/32 grain of Arsylen daily. This dose would seem to be entirely negligible for specific effect, though its continued and indiscriminate use might lead to undesirable rather than desirable results. Both the Council on Pharmacy and Chemistry and the Committee on Foods have gone on record as holding claims for "tonic" action of any drug or food to be misleading and unwarranted.

According to M. Roch and M. S. Katzenelbogen (*Rev. méd. de la Suisse Rom.* **42**:689, 1922), Arsylen is propenyl-arsenic acid containing 45 per cent of arsenic. It is employed as the monosodium salt by the injection route and as the monocalcium salt by mouth. It is a superior homologue of methyl arsenic acid, of which the disodium salt is known under the name Arrhenal. It is given in doses of from 5 centigrams to 1 decigram a day by mouth, or by the injection route in a dose of 2 decigrams every other day. The authors have used a dose as high as 0.6 Gm. by the intramuscular and intravenous injection route every other day or every three days. The maximal dose for a man of 150 pounds (68 Kg.) is 3.25 Gm. The authors make a short report on the treatment of forty cases. Some of these were psoriatic patients, but at the same time they had treatment on the skin locally. They also treated some symptomatic anemias of tuberculosis and of cancer, posthemorrhagic anemias, and anemias secondary to bothriocephalus; also eight anemias of various types. In seven of their cases, the results showed nothing. In many of the others the results were nothing startling and it is well known how, with rest in bed and nourishment, the red cell count and hemoglobin will pick up in a posthemorrhagic anemia without any other therapy. The same is also true with certain cases of tuberculosis, with complete rest in bed. Moreover, in one of their forty cases, a case of psoriasis, after a month and a half of treatment, there developed an acnelike eruption of the skin, which disappeared only after the removal of further medication.

As to dosage, these authors recommend that Arsylen be ordinarily used in amounts of from 50 to 100 milligrams a day. If the patient were to take the maximum dosage of "Tonikum" recommended by Hoffmann-LaRoche, Inc., he would receive but 12 milligrams of Arsylen per day. Moreover, these authors stress the relationship to another preparation, Arrhenal, a preparation which was subject of adverse comment by THE JOURNAL, Feb. 26, 1921, page 595, and in "Propaganda for Reform in Proprietary Medicines," volume 2, page 492.

The advertising asserts that the manganese contained in Tonikum "has a catalytic effect on intracellular oxidation. . . . stimulates red blood-cell formation and hepatic activity." Concerning manganese compounds, New and Nonofficial Remedies 1932 states: ". . . in spite of the many years of its trial, no acceptable evidence has been brought forward to show that the administration of manganese compounds has a favorable effect on blood formation." In New and Nonofficial Remedies, nothing is said as to the hepatic activity of manganese compounds or as to any influence on intracellular oxidation, and although more recent work indicates that it facilitates the utilization of iron in the nutritional anemia of young rats, there is still no evidence that it is of any benefit in any clinical condition. Moreover, it is very doubtful whether the manganese is present in the form of the metallic element, as the label seems to imply.

The advertising states that Kola "makes Tonikum 'Roche' valuable in improving the mental outlook of the patient." The label states that the content of Kola is equivalent to 90 grains of kola seed, the value of which lies in its content of caffeine. According to this the improvement would be less than might be expected from three cups of coffee a day.

Concerning the phosphorus content of Tonikum, the advertising sets forth that this is ". . . an element essential to all living cells and an especial requisite for cell regeneration. It is an important constituent of bone and blood and occurs in all other tissues. A daily intake of phosphorus is absolutely necessary if health is to be maintained." This is literally true; and exactly the same could be said for the water that is in

Tonikum. In effect, the implied claim is essentially misleading as an argument for using Tonikum. The Council has held that "Ordinary diets provide an excess of phosphates which are excreted, and there is no advantage to be derived from the addition of any form of combined phosphorus to the diet" (Metatone Not Acceptable for N. N. R., THE JOURNAL, May 3, 1930, p. 1405).

The effect of the nux vomica constituent of Tonikum, it is stated, is "due principally to its alkaloid strychnine." In the recommended dosage of Tonikum the patient would receive, according to the statement of composition, from 3/50 to 9/50 grain of extract of nux vomica daily, equivalent to about 1/300 grain of strychnine per dose; the degree to which this would increase the general muscular tone can only be imagined but not perceived. On the other hand, the long continued and indiscriminate use even of this dose is certainly not to be recommended.

Taken as a whole, "Tonikum"-Roche is a "shotgun" proprietary "tonic" marketed under a therapeutically suggestive name with misleading therapeutic claims and in such a manner as to lead to its indiscriminate and ill advised use by the public, which, when taken continuously, would tend to an undesirable accumulation of arsenic in the system. The Council declared it unacceptable for New and Nonofficial Remedies.

Committee on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

MERCK'S BANANA POWDER

Manufacturer.—Northjohn Corporation, Lincoln, N. J.

Distributor.—Merck & Co., Inc., Rahway, N. J.

Description.—Spray dried ripe bananas retaining the natural enzymes and vitamins in accordance with the following approximations; vitamins A (100 per cent), B (100 per cent), C. (20 per cent) and G (100 per cent).

Manufacture.—Standard green bananas are stored in ripening rooms under controlled temperature and humidity conditions to insure thorough ripening. The ripening process requires from eight to fourteen days, or about twice the time given for ripening bananas for commercial sale. The ripe fruit is peeled, and the strings and bitter tip ends are removed. The pulp is ground to a liquid, pumped to the top of a drying tower and sprayed into heated air, the temperature of which is carefully controlled. The dry solids fall on a floor specially designed to prevent excessive heating of the dry powder, which is continuously discharged. The powder is sifted and automatically packed in friction top cans.

Analysis (submitted by manufacturer).—

	per cent
Moisture (vac. 70 C.)	2.5
Ash	3.2
Fat (petroleum ether extract)	1.5
Protein (N × 6.25)	4.9
Reducing sugars as invert	32.7
Sucrose (copper reduction method)	33.2
Dextrin (hydrolysis of water extract of sugar-free sample; copper reduction method)	9.6
Starch (pancreatin digestion of dextrin and sugar-free sample; polarimetric method)	7.8
Crude fiber	3.3
Carbohydrates other than crude fiber (by difference)	84.6

Tests indicate that the natural enzymes are practically unimpaired by the drying.

Calories.—3.7 per gram; 105 per ounce.

Micro-Organisms.—The manufacturer claims that the dehydration, together with the temperatures used, renders any accidentally introduced bacteria inactive, as determined by many cultures made of the finished and packaged product. Cleanliness of the equipment and supervision of the peeling operation limits the danger of accidental bacteria contamination.

Vitamins.—Biologic assay shows approximately 100 per cent retention of vitamin A, 100 per cent of B, 20 per cent of C and 100 per cent of G of the natural ripe fruit.

Claims of Manufacturer.—Merck's Banana Powder makes the essentials of standardized ripe bananas available throughout the year. It is intended for all table uses of bananas, the preparation of banana milk drinks, as a carbohydrate supplement for infant and invalid feeding, and as a valuable adjunct in special diets. The banana powder is equivalent to four times as much ripe pulp. Two and one-half level tablespoonfuls of powder equals one average banana; one tablespoonful equals 8 Gm.; three and one-half tablespoonfuls equals 1 ounce.

DR. P. PHILLIPS FLORIDA FANCI-CUT ORANGE SLICES

(With Added Cane Sugar)

Manufacturer.—Dr. P. Phillips Company, Doctor Phillips, Fla.

Description.—Canned sliced Florida oranges, sweetened with added sucrose and retaining in large measure the original natural vitamin content.

Manufacture.—The manufacture and canning are essentially the same as for Dr. P. Phillips Florida Fanci-Cut Grapefruit Slices (THE JOURNAL, Nov. 19, 1932, p. 1781).

Analysis (submitted by manufacturer).—

	per cent
Moisture	83.2
Ash	0.5
Fat (ether extract)	0.2
Protein (N × 6.25)	0.9
Reducing sugars as invert	10.3
Sucrose (by copper reduction method)	3.8
Crude fiber	0.5
Carbohydrates other than crude fiber (by difference)	14.7
Titratable acidity as citric acid	0.6

Calories.—0.6 per gram; 17 per ounce.

Vitamins.—Assay demonstrated that from 1.3 to 1.5 Gm. daily was the minimum protective dose against scurvy for 300 Gm. guinea-pigs. The minimum protective dose of juice of fresh oranges on the northern market was 2.0 Gm.

Claims of Manufacturer.—These canned sweetened sliced oranges retain practically all the nutritional values of the natural fresh fruit and are intended for all the dietary and table uses of oranges.

SQUIBB CHOCOLATE FLAVORED VITAVOSE

A Food Drink Rich in Vitamins B and G and Iron

Manufacturer.—E. R. Squibb and Sons, New York.

Description.—A powdered mixture of sucrose, Vitavose (extract of malted wheat germ and U. S. P. malt), cocoa, skim milk and lactose; vanilla flavored; contains substantial quantities of vitamins B and G and of iron.

Manufacture.—The foregoing ingredients are carefully admixed and automatically packed in tins. The Vitavose ingredient is described in THE JOURNAL, Aug. 6, 1932, page 477.

Analysis (submitted by manufacturer).—

	per cent
Moisture	2.8
Ash	2.7
Fat	1.8
Protein (noncaffeine and nontheobromine N × 6.25)	9.4
Caffeine	0.04
Theobromine	0.13
Crude fiber	0.6
Carbohydrates other than crude fiber (by difference)	82.5
Iron (Fe)	0.004
Copper (Cu)	0.0016
Zinc (Zn)	0.002

Calories.—3.8 per gram; 108 per ounce.

Vitamins.—Vitamin assay shows a content of vitamins B and G at least equal to thirty-three times and ten times, respectively, that of equal weights of raw fresh whole milk.

Claims of Manufacturer.—Intended especially for the carbohydrate, food iron and vitamins B and G supplement of milk for infants or malnourished adults and children, expectant and nursing mothers, invalids and convalescents.

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SATURDAY, DECEMBER 17, 1932

THE ACTION OF COPPER IN IRON METABOLISM

The total amount of iron in the body is rather small, probably not exceeding 3 Gm., or 0.004 per cent of a person of adult size. The daily "turnover" or requirement of this element is currently estimated to be not more than 15 mg., or one-fourth grain. Yet under normal conditions of diet and health this quantity of iron suffices to assure the success of a number of extremely important biologic functions. It maintains the integrity of the supply of respiratory pigment—the entire hemoglobin content of the blood; it enters into the composition of every cell. Furthermore, it is widespread in nature and is at least a trace component of most natural foods.

In the varied conditions of shortage of hemoglobin that are collectively designated as anemia, regeneration of the missing blood components calls for a supply of iron. Iron therapy has long been practiced in the treatment of anemia. Many observers have been struck by the apparent ineffectiveness of all the familiar types of iron compounds in certain forms of anemia. Thus, in pernicious anemia the administration of iron alone fails to effect a permanent increment of red blood cells. Something more is necessary, as the success of modern liver therapy has shown.

A deficit in the iron intake will presently lead to anemia. A demonstration of this is readily afforded experimentally by placing suitable laboratory animals on a diet of cow's milk exclusively. This food is not sufficiently rich in iron, in the quantities requisite for the nutrition of the young, to serve as an adequate supply of the element after the abundant stores of iron in the new-born have become exhausted. The resulting condition, which may exist despite other indexes of good health, is commonly designated as nutritional anemia to distinguish it from other forms of anemia in which a persistent destruction of red blood cells leads to the characteristic blood picture. It is surprising, indeed, that administration of pure iron salts in experimental nutritional anemia of the sort described usually fails to insure the regeneration of hemoglobin.

The importance of copper as a supplement to iron for the regeneration of hemoglobin in anemic rats was first demonstrated four years ago by Hart, Steenbock, Waddell and Elvehjem.[1] These investigations showed definitely, as Elvehjem and Sherman[2] have recently pointed out, that, in the presence of copper, soluble inorganic iron salts can be used directly for the formation of hemoglobin. Since that time a number of workers have studied factors affecting the production of hemoglobin in rats rendered anemic by whole milk diets. Most of this work has verified the original conclusions concerning the importance of copper; and today, although there are some who still feel that copper is not the only element in addition to iron which possesses hematopoietic properties, nearly all workers agree that copper is an active agent in hemoglobin synthesis. In most of these studies the activity of copper has been measured by comparing the increase in the hemoglobin content of the blood of anemic rats when pure iron alone is fed with the improvement obtained when the iron is accompanied by traces of copper. Aside from the fact that the hemoglobin molecule does not contain copper, nothing is known about the action of this element.

How, then, does the copper function? Various observers have noted that iron given orally, subcutaneously or intravenously tends to increase the store of iron in those organs, namely, the liver and the spleen, that are recognized depots for the element. Such storage may happen, as Elvehjem and Sherman have demonstrated at the University of Wisconsin, without any attendant hemoglobin formation. In other words, absorption and retention of iron do not necessarily insure its conversion into hemoglobin. In the Wisconsin experiments the addition of pure iron to the milk diet of anemic rats, which had been well depleted in their reserve of iron, had no effect on the hemoglobin content of the blood but increased the total iron content of the liver and spleen to a large extent. When the iron was replaced by copper, the store of iron in the liver was used directly for building blood hemoglobin. The copper caused only a slight decrease in the iron content of the spleen but produced a definite increase in the size of this organ. When graded levels of inorganic iron were fed in the absence of copper, the hemoglobin content of the blood remained unchanged and the amount of iron stored in the liver was proportional to the amount of iron fed. In the presence of copper, the rate of hemoglobin formation was dependent on the iron intake. As Elvehjem and Sherman conclude, copper does not affect the assimilation of iron but does function in the conversion of inorganic iron into hemoglobin.

In recording these studies, which seem destined to throw a new light on many problems of hematopoiesis,

1. Hart, E. B.; Steenbock, Harry; Waddell, J., and Elvehjem, C. A.: J. Biol. Chem. **77**: 797 (May) 1928.
2. Elvehjem, C. A., and Sherman, W. C.: The Action of Copper in Iron Metabolism, J. Biol. Chem. **98**: 309 (Oct.) 1932.

it seems desirable to remember that the extent to which the experimental studies are applicable to the human being remains for the most part to be established. Copper is far more widespread in foods than may be commonly supposed. The need for copper is quantitatively far smaller than the requirement of iron. The newer knowledge should not be accepted as a warrant for uncontrolled administration of copper compounds to man. The facts regarding the possible actual needs and function of this element in human physiology remain to be more definitely ascertained. Hematopoiesis is something more than mobilization of iron and copper. Destruction of blood cells is a process that may be initiated by independent causes. Enthusiasm for the new discoveries must not be permitted to open the door to unfounded therapy.

ETIOLOGY OF WHOOPING COUGH

The current assumption that whooping cough is caused by the Bordet-Gengou bacillus and that prophylactic immunization with the corresponding Bordet-Gengou vaccine is justifiable is based solely on clinical impressions. The demonstration of the bacillus in human sputum during the early stages of this infection and the subsequent appearance of complement deviating antibodies for the bacilli are not proof that the bacillus is the primary cause of the disease or that immunization against the bacillus would necessarily have any appreciable prophylactic value. The recent suggestion by McCordock,[1] for example, that the etiologic factor of whooping cough is an unknown filtrable virus, with the Bordet-Gengou bacillus as a common but possibly nonessential secondary invader, emphasizes the present lack of convincing experimental data.

Recognizing this lack, the John J. Abel Fund for Research on the Common Cold, of Johns Hopkins University, has recently financed an experimental study of whooping cough in chimpanzees.[2] Several of the animals were inoculated, their throats being sprayed with sterile filtrates from early human cases of whooping cough. After incubation periods of from five to seven days, febrile catarrhs of the upper respiratory tract developed, with absence, however, of the typical paroxysmal cough. "These catarrhs differed only in minor points . . . from the typical picture of experimental common colds in apes."

Two chimpanzees were then inoculated with unfiltered early human whooping cough sputums. These sputums contained both the filtrable factor and the Bordet-Gengou bacillus. Thirty days after this inoculation, after the subsidence of the initial catarrh of the upper respiratory tract, a typical paroxysmal cough developed in one of these chimpanzees, which lasted for seven weeks. A third chimpanzee was allowed to drink a heavy suspension of the freshly isolated Bordet-Gengou bacillus. After an incubation period of twenty-four days, typical whooping cough developed, lasting for about six weeks. A fourth chimpanzee was similarly inoculated with a third generation culture of the same micro-organism, with the development of typical whooping cough. In all three positive cases, complement deviation reactions against the pertussis antigen developed during the experimental infection.

From these data the Johns Hopkins research group concludes that there can be no doubt that typical whooping cough developed in the three apes inoculated with pure cultures of the Bordet-Gengou bacilli or with the whole human sputum, and that it was indistinguishable in its clinical and bacteriologic aspects from the human disease. The results in the chimpanzees inoculated with the filtrates, however, were open to two interpretations. One interpretation would assume that the catarrhal condition represents the action of a heretofore unrecognized filtrable virus which might conceivably act as the primary infecting or exciting agent in whooping cough. A more conservative interpretation, however, would assume that the catarrhal condition was simply a common cold and that the human sputum contained both the Bordet-Gengou bacillus and the common cold filtrable virus.

While the currently assumed clinical value of prophylactic immunization with pertussis vaccine has not yet been confirmed by the Baltimore research group, the published data strongly suggest its continued empirical use.

THE NUTRITIVE VALUE OF PENTOSE SUGARS

It is not many years since the six-carbon sugar dextrose, commonly called glucose, was available only on the shelves of the chemist. Dextrose was, of course, known as a normal component of the blood and as an occasional abnormal component of diabetic urine. It was recognized as an ingredient of invert sugar familiarly represented by the carbohydrates of honey. But pure dextrose did not become available at low cost on a large scale until recently. This development of the industry whereby the starch of cheap cereals is converted by chemical procedures into a pure six-carbon sugar was associated with doubts in the mind of the public as to the dietary wholesomeness of a sugar prepared by an artificial method rather than in nature's own laboratories. The qualms of uncertainty have now for the most part been dispelled. Dextrose is recognized as a wholesome, assimilable sugar, regardless of whether it owes its origin to the natural processes in the bodies of animals and plants or to the chemist's ingenuity in the food factory. It is almost amusing to read today the debates on this subject and the experiments that were undertaken in previous decades to

1. McCordock, H. A.: Intranuclear Inclusions in Pertussis, Proc. Soc. Exper. Biol. & Med. **29**: 1288 (June) 1932, cited in Is Whooping Cough Due to a Filtrable Virus, editorial, J. A. M. A. **99**: 1866 (Nov. 26) 1932.
2. Rich, A. R.; Long, P. H.; Brown, J. H.; Bliss, Eleanor A., and Holt, L. E., Jr.: Experiments on the Cause of Whooping Cough, Science **76**: 330 (Oct. 7) 1932.

establish that the mere fact of artificial "synthesis" by no means excludes the possibility of the nutritive worth of a product. Curiously enough, in the case likewise of gelatin, produced in the factory by chemical hydrolysis, there was some uncertainty on the part of the public despite the fact that the housewife was accustomed to produce and serve gelatin prepared by household (and unrecognized) hydrolysis when bones were boiled in the kitchen kettles.

As a consequence of this era of slow education emphasizing that thoroughly wholesome foods may be "synthesized" in the laboratory and the factory, the pendulum has sometimes swung too far in the direction of ready acceptance of physiologically untested products. Chemical purity of a substance, established by a dependable laboratory or firm, has become by implication a sort of guaranty of wholesomeness. For many years the five-carbon sugars have been relatively rare substances that could be prepared only with difficulty and at considerable cost. The fact that these carbohydrates, though not components in a free state of the animal body, are rated chemically as sugars and have many properties of the more familiar dietary sugars has encouraged the belief that five-carbon, or pentose, sugars might have real nutritive values in the body. Experimental investigation has shown, again and again, that this is not the case. Pentoses are not readily utilized as are dextrose, levulose, sucrose, maltose and lactose, all of which represent or are converted into six-carbon sugars before or after absorption, or else they are eliminated unchanged.

Recently the United States Bureau of Standards in a cooperative investigation announced a simple method of preparing xylose,[1] a pentose, from cottonseed hull bran, an inexpensive raw material. Xylose thus becomes a sugar obtainable at a price comparable to that of sucrose. The wide publicity given to this announcement of the cheap production of xylose on a semicommercial scale has led to statements concerning xylose that may be misleading. Thus, xylose has been characterized[2] as a "slenderizing sugar from cottonseed" and, in the same article, as a "nonfattening sugar." Since in popular usage the term sugar is usually considered to imply a substance utilizable as a food by the higher forms of animal life, it becomes of importance to raise again the question of the rôle of xylose (and the pentoses) in nutrition. This has been done at the University of Michigan Medical School by Miller and Lewis.[3] In confirmation of the work of earlier investigators, xylose (sometimes also called wood sugar) was shown to be absorbed readily but at a rate much less rapid than was dextrose. Under the experimental conditions, no formation of glycogen could be demonstrated after the oral administration of xylose, whereas similar tests with dextrose indicated the usual carbohydrate storage. Other observations[4] likewise indicate that the alleged nutritive value of pentoses remains to be demonstrated. They further substantiate the dictum that biologic experimentation must in many instances be instituted to supplement purely chemical information before the possible physiologic value of a product can be safely assured.

1. Schreiber, W. T.; Geib, N. V.; Wingfield, B., and Acree, S. F.: Indust. & Engin. Chem. **22**: 497, 1930.
2. Literary Digest **105**: 30, 1930.
3. Miller, M. M., and Lewis, H. B.: Pentose Metabolism: I. The Rate of Absorption of d-Xylose and the Formation of Glycogen in the Organism of the White Rat After Oral Administration of d-Xylose, J. Biol. Chem. **98**: 133 (Oct.) 1932.
4. Miller, M. M., and Lewis, H. B.: Pentose Metabolism: II. The Pentose Content of the Tissues of the White Rat After the Oral Administration of d-Xylose, J. Biol. Chem. **98**: 141 (Oct.) 1932.

Current Comment

FOOD SUPPLY AND PELLAGRA INCIDENCE[1]

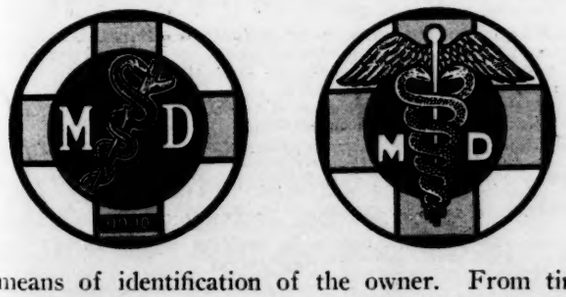
Pellagra occurs particularly among families whose diet consists mainly of highly milled cereals, sweets, and lard or salt pork. The continued use of such a diet will result in the development of pellagra. The food factor that prevents the disease is found with fair abundance in milk, lean meat and fish and sparingly in many vegetables but is lacking in highly refined flour and cereals, in fats and in sugar. An estimate by the United States Public Health Service indicates that some 200,000 persons had pellagra in 1929. The cases occurred mostly in the South in families of low income. Investigators for the United States Department of Agriculture, working in cooperation with the South Carolina State Board of Health, recently made a study of the food supply of seventy-three families living on farms in South Carolina, and also of the incidence of pellagra among these people. The investigators divided the families into two groups: those in an unsatisfactory economic condition, some of whose members had pellagra and who it seemed could not possibly supply themselves with proper foods; and, second, families whose economic condition indicated that they could probably supply themselves with the necessary foods if informed concerning them. Fifteen out of twenty-nine families supposed to be able to secure proper foods could not do so, and pellagra developed in some of the members of these families. The food supplied to the first group included dry skim milk, evaporated milk, wheat germ, cured lean pork, canned tomatoes and pure dried yeast. The investigators, Misses Hazel K. Stiebeling and Hazel E. Munsell of the Bureau of Home Economics, made most careful studies of the diets taken by the families, their money values, their nutritional qualities, and their nutritive values from the point of view of energy, proteins, minerals and vitamins. The length of time that a person can live on an inadequate diet without having pellagra apparently depends on the degree of inadequacy of the diet and on the amount of the pellagra preventing factor that the person may have stored during a period of dietary surplus. In fourteen families that did not receive aid

1. Food Supply and Pellagra Incidence in Seventy-Three South Carolina Farm Families, by Hazel K. Stiebeling, Senior Food Economist, Economics Division, and Hazel E. Munsell, Senior Nutrition Chemist, Foods and Nutrition Division, Bureau of Home Economics, in Cooperation with the South Carolina Extension Service and the South Carolina State Board of Health; Technical Bulletin 333, October, 1932; United States Department of Agriculture, Washington D. C.

and were taking small amounts of the pellagra preventing foods, two cases of pellagra developed: one in an adult woman who would not drink milk and the other in a 10-year-old girl with a "finicky" appetite. The studies indicated that some people can store the pellagra preventing factor better than others, which explains why some people come down with the disease in certain families whereas others do not. There is always competition in the diet between foods that satisfy the appetite and foods that are necessary for health. Among some families the amount of money spent for food is so low that it cannot possibly purchase the necessary food substances. In many instances it was shown, however, that enough money was being spent to secure the correct foods but that it was being spent on foods not wisely chosen from the point of view of health. In any event, these studies demonstrated that the addition of from 2 to 4 ounces of dried skim milk, or 1 pound of evaporated milk, or from 1 to 2 ounces of wheat germ, or 1½ pints of canned tomatoes, or ½ pound of cured lean pork, or 1 ounce of pure dried yeast per person daily to the food supply customarily used in winter and early spring is sufficient to reduce greatly the incidence of pellagra among those people who are likely, in times of economic depression, to live largely on monotonous and one-sided diets which contain little milk, lean meat, fish or eggs. For families living on farms, the most economical means of providing the foods necessary to prevent pellagra is to produce those foods on the farm and to save them to a considerable extent for their own use.

AUTOMOBILE INSIGNIA

For some years the American Medical Association has been selling automobile insignia to physicians, indicating their membership in the medical profession and also in the American Medical Association. Each emblem is registered in the headquarters office of the American Medical Association and thus may serve as



a means of identification of the owner. From time to time physicians have been disturbed by the fact that a manufacturer of automobile insignia has been issuing a poor imitation of the device of the American Medical Association, and has thereby been depreciating its value. On occasion, physicians have purchased the imitation thinking they were actually getting the American Medical Association emblem. The official emblem of the medical profession is the rod with a single serpent. The rod with the wings and double serpent is the emblem of Mercury, messenger of the gods. It is also an emblem for commerce. The official emblem of the American Medical Association is illustrated on the left and the mercury emblem on the right.

Medical Economics

NEW FORMS OF MEDICAL PRACTICE

8. Health Promotion Service

This is a urinalysis service with headquarters in Memphis, Tenn. N. D. Sappenfield is president and treasurer, F. S. Baker secretary, and Howard M. Jamieson, M.D., vice president and medical director. The latter is a Member and Fellow of the American Medical Association and a member of the American College of Physicians, the New England Society of Psychiatry and the American Society of Clinical Pathologists.

The service consists of four urinalyses yearly, with detailed reports of results, for which $12 is charged. Purchasers are apparently obtained by advertising and mail solicitation. The advertising is of the "scare" type, long the main dependence of commercial medical publicity. One piece of such literature consists of "a few of the many shocking notices from January Memphis papers" and is made up by grouping clippings of newspaper reports of deaths from heart disease of persons between 30 and 50 years of age. The center of the group is a reproduction of a photograph of a man who has apparently died at his desk, under which is the statement:

Yesterday: Never looked better—Today: Victim of Heart Attack

In a circle, the following further appeal to fright is displayed:

DIED . . .
suddenly. .
in life's prime. . .

The increasing number of vigorous, active men—neighbors and friends—who succumb at the Dangerous Age (40-to-60) warns you to "Watch YOUR Heart." Despite the recent alarming news, MOST DISEASE IS PREVENTABLE. Listen to a well-known Doctor: ". . . if a man in average good health has a careful examination of his urine made by a competent laboratory at regular intervals of, say three months, he can, IN ALMOST EVERY CASE get a timely warning not only of things beginning to go wrong in his heart or kidneys . . . but of arteriosclerosis (hardening of arteries), diabetes and other conditions . . . in a sufficiently early stage . . ."

Write your name below. You cannot afford to be without HEART-facts — THE PENALTY IS TOO HIGH.
WATCH YOUR HEART

Underneath the photograph are some testimonials from laymen as to the value of the service. The coupon which is to be signed reads:

HEALTH PROMOTION SERVICE, Inc.
Sterick Bldg.,
Memphis, Tennessee.

Gentlemen:

Understanding that 60% of the important diseases show up in the urine before a patient is aware of danger, I hereby subscribe for Health Promotion Service, including four Quarterly Reports and personal suggestions by your Medical Director.

Price: $12.00 per year.

.....
.....

In spite of the fact that this entire advertisement is built around the suggestion that a urinalysis serves to diagnose heart disease, a letter from the president affirms that "diagnosis is NOT a part of our service and we make no promise to anybody to render such a service." Yet this same advertisement assures the reader that:

SOME THINGS URINALYSIS DOES
— Indicates heart and kidney disorders, often before they are serious.
— Takes but 2 minutes a year.
— Does not require leaving your office.
— Is NOT a medical service.

The sample report of an analysis which is furnished repeatedly advises consulting a physician in case certain results are shown, and the letter quoted further states: "We have no treatment or diagnosis to offer." This would seem to indicate a desire at least to cooperate with the medical profession and to confine the service to reports of laboratory results.

But the exigencies of commercialization of such a service, which lead to such advertising statements as those quoted, would certainly seem to imply that the first step in guarding

against the pictured horror of heart disease and other ailments is not to consult a physician and have a thorough examination, which quite properly would include as one and only one phase in the process, a urinalysis. The advertising implies, on the other hand that the horrors of chronic diseases may be avoided if not averted simply by a urinalysis four times yearly.

COMMENT

The evil of all such services, granting that they are honestly and efficiently conducted, is that they seize on one phase in diagnosis or treatment, which lends itself to commercialism, and exaggerate its importance and significance. There is always the danger that the interpretation which a layman might make of such a report, without adequate knowledge of the methods of interpretation, and ignorant of modifying conditions, may cause him wrongly to believe himself in a dangerous stage of disease. The results of such an error are at least as undesirable as the conditions the analysis is advertised to guard against.

The reverse effects are only a little less undesirable. One of the published testimonials says:

> I know several corporation heads who not only consider the Urinalysis reports as vital check-ups but a laboratory comparison of health and strength from quarter to quarter. The mind's ease of knowing what the test tube tells about heart and kidneys every three months is of great value to me.

The trained physician knows that a urinalysis alone does not justify any such "mind's ease" as has been conferred on the writer of this testimonial. It would be just as easy to write similar scare advertising, with promise of similar "mind's ease," for a metabolic test, x-ray examination, blood pressure determination, or other standard parts of a genuine diagnostic examination as for a urinalysis. Moreover, if such commercial schemes as the one described prove profitable to their promoters, we may expect to see all of these other tests that lend themselves to mass handling exploited in the same way. Such disintegration and individual exploitation for profit of the many parts of what is of value only as a complete whole cannot be helpful in assuring good medical care at a reasonable cost.

Any such scheme, if profitable, inevitably encourages the appearance of competitors. Pressed by the profit motive, which must dominate commercial competition, the advertising becomes more flamboyant and frightening, the promises less restrained, and the service deteriorated. That this last effect is far from imaginary was shown by the investigation by the Chemical Laboratory of the A. M. A. of a urinalysis service advertised by Montgomery Ward, and which that company promptly discontinued when made aware of the character of the service (THE JOURNAL, April 30, p. 1561).

Association News

ANNUAL CONGRESS ON MEDICAL EDUCATION, MEDICAL LICENSURE AND HOSPITALS

Tentative Program

The Annual Congress of the Council on Medical Education and Hospitals of the American Medical Association will be held in the Palmer House, Chicago, February 13 and 14, 1933. The Federation of State Medical Boards of the United States and the American Conference on Hospital Service will participate in the congress. The program follows:

MONDAY MORNING, FEBRUARY 13

RAY LYMAN WILBUR, M.D., Presiding
Washington, D. C.

Report of the Chairman of the Council on Medical Education and Hospitals of the American Medical Association
Ray Lyman Wilbur, M.D., Washington, D. C.

Results of the Work of the Commission on Medical Education
Samuel P. Capen, Ph.D., Chancellor, University of Buffalo.

Medical Education Abroad
Alan Gregg, M.D., Director, The Medical Sciences, The Rockefeller Foundation, New York.

Comments on the Internship
Willard C. Rappleye, M.D., Dean, Columbia University College of Physicians and Surgeons, New York.

MONDAY AFTERNOON

JOINT SESSION OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS AND THE FEDERATION OF STATE MEDICAL BOARDS

RECOGNITION OF SPECIALISTS

The Function of Special Boards of Examiners
Sanford R. Gifford, M.D., Chicago.

The Function of the States
Walter L. Bierring, M.D., Secretary-Treasurer, The Federation of State Medical Boards of the United States, Des Moines.

The Function of Medical Schools
Irving S. Cutter, M.D., Dean, Northwestern University Medical School, Chicago.

The Function of the American Medical Association
Ray Lyman Wilbur, M.D., Chairman, Council on Medical Education and Hospitals, American Medical Association, Washington, D. C.

TUESDAY MORNING, FEBRUARY 14

JOINT SESSION OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS AND THE AMERICAN CONFERENCE ON HOSPITAL SERVICE

NURSING

HARRY E. MOCK, M.D., Presiding
President, American Conference on Hospital Service, Chicago

Nursing Education and Nursing Service
Effie J. Taylor, R.N., President, National League of Nursing Education, New Haven.

Cost of Nursing Service and Nursing Education
C. Rufus Rorem, Ph.D., Associate, Medical Services, Julius Rosenwald Fund, Chicago.

The Function of the Nurse as Defined by the Physician
George H. Coleman, M.D., Chicago.

Nursing as Related to Hospital Administration

TUESDAY MORNING

THE FEDERATION OF STATE MEDICAL BOARDS OF THE UNITED STATES

THOMAS J. CROWE, M.D., Presiding
President, The Federation of State Medical Boards, Dallas, Texas

Philosophy of Medical Licensure
H. M. Platter, M.D., Secretary, Ohio State Medical Board, Columbus.

Dental Licensure Problems
J. V. Conzett, D.D.S., Chairman, National Board of Dental Examiners, Dubuque, Iowa.

The Licensing of European Medical Graduates
William D. Cutter, M.D., Secretary, Council on Medical Education and Hospitals, American Medical Association, Chicago.

Experience of the New York Board of Medical Examiners with Physicians Trained Abroad
Harold Rypins, M.D., Secretary, Albany.

TUESDAY NOON

Luncheon. The Federation of State Medical Boards of the United States.

Luncheon Meeting. Central Council for Nursing Education. Winford H. Smith, M.D., Director, The Johns Hopkins Hospital, Baltimore, will speak on "Future Trends in Nursing."

TUESDAY AFTERNOON

Training of Laboratory Technicians
Walter M. Simpson, M.D., President, The American Society of Clinical Pathologists, Dayton, Ohio.

The Need of Professionalization in Public Health
John A. Ferrell, M.D., Associate Director, International Health Division, The Rockefeller Foundation, New York.

Who Should Teach Physical Therapy
F. J. Gaenslen, M.D., Professor of Orthopedic Surgery, University of Wisconsin Medical School, Madison.

The Council on Physical Therapy of the American Medical Association—Its Problems and Its Progress
Harry E. Mock, M.D., Chairman, Chicago.

TUESDAY AFTERNOON

THE FEDERATION OF STATE MEDICAL BOARDS OF THE UNITED STATES

THOMAS J. CROWE, M.D., Presiding
President, The Federation of State Medical Boards, Dallas, Texas

Licensure Problems in the Southern States
N. D. Buie, M.D., President, Texas State Board of Medical Examiners, Marlin.

Interstate Endorsement of Medical Licensure
J. N. Baker, M.D., State Health Officer, Montgomery.

Regulation of the Practice of Pharmacy
H. C. Christensen, Secretary, National Association of Boards of Pharmacy, Chicago.

Federation Business Session

Reduced Railway Fares

In order to obtain the reduced rate of one and one-half fares for the round trip to Chicago, it will be necessary to secure at least 100 receipts showing that full fares have been paid on the trip to Chicago. The reduced rates, if enough receipts are secured, will apply to friends and relatives as well as to those regularly invited to the congress.

Be sure to obtain a *certificate receipt for your fare to Chicago*, however small it will be, so that those coming from distant states or across the continent will have the benefit of the one-half return fare. The receipt, after being countersigned by an official of the passenger associations, who will be present at the Palmer House, will entitle its holder to the reduced fare on the return trip.

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts on Monday and Wednesday from 9:45 to 9:50 a. m. (central standard time) over Station WBBM (770 kilocycles, or 389.4 meters).

The subjects for the week are as follows:

December 19. Common Skin Diseases of Children.
December 21. Christmas Gifts.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

University News.—William W. Cort, Ph.D., Baltimore, delivered the annual address of the Alpha Alpha chapter of Alpha Epsilon Delta, November 16, at the University of Alabama, on "The Hookworm Problem in the United States." Following the lecture, Dr. Cort was made an honorary member.

Dr. Hill Honored.—The completion of fifty years in the practice of medicine by Dr. Luther L. Hill, Montgomery, was observed, November 21, with a banquet in his honor by the Montgomery County Medical Society. Dr. James N. Baker, state health officer, presented a silver cup to Dr. Hill on behalf of the society. Included among the speakers at the celebration were Drs. Charles A. Thigpen, Arthur H. Montgomery and William S. Hannah, president of the local society. Dr. Hill, who has been practicing in Montgomery since 1884, was president of the local board of health in 1893 and of the U. S. Board of Pension Examiners in 1894. He is a past president and a life councilor of the Alabama State Medical Association, and a past president of the Montgomery Medical and Surgical Society.

CALIFORNIA

Annual Midwinter Course in Ophthalmology and Otolaryngology.—The Research Study Club of Los Angeles will conduct its second midwinter clinical course in otolaryngology and ophthalmology, January 16-17. The program will include the following:

Dr. John F. Barnhill, professor of surgery of the head, Indiana University School of Medicine, Indianapolis.
Dr. John E. Weeks, emeritus professor of ophthalmology, University and Bellevue Hospital Medical College, New York.
Dr. Joseph C. Beck, professor of laryngology, rhinology and otology, University of Illinois College of Medicine, Chicago.
Dr. Bernard Samuels, professor of clinical surgery, department of ophthalmology, Cornell University Medical College, New York.
Dr. Sanford R. Gifford, professor of ophthalmology, Northwestern University Medical School, Chicago.
Dr. Joseph L. McCool, clinical professor of ophthalmology, University of California Medical School, San Francisco.
Stacy R. Guild, Ph.D., lecturer in otology and director, Otological Research Laboratories, Johns Hopkins University School of Medicine, Baltimore.
Mr. Edgar B. Burchell, technician, New York Eye and Ear Infirmary.
Vern O. Knudsen, Ph.D., department of physics, University of California at Los Angeles.
Dr. Ernest M. Hall, professor of pathology, University of Southern California School of Medicine, Los Angeles.

Mornings and evenings will be devoted to didactic lectures, and the afternoons will be occupied by clinical diagnostic and surgical demonstrations. The fee for the course is $50. Further information may be obtained from Dr. Donald S. Dryer, 2007 Wilshire Boulevard, Los Angeles.

Medical Service for Persons of Moderate Means.—The California Medical Association has approved a plan to provide complete medical service and hospitalization to persons of moderate means and will present it to county medical societies. Under this plan each county society would fix its own rates on an annual, semiannual or quarterly basis and would determine for itself the maximum income regarded as coming within the term moderate means. Persons whose financial status exceeded this maximum would not be eligible for the service. Professional service would be offered to persons whose income for the preceding year was below a certain fixed sum, the service to mean physicians' and surgeons' attendance only for types of disease and injury to persons not protected under the workmen's compensation act. Each county unit would operate as a partnership and the division of moneys received would be on a unit basis, a fixed amount for each type of service. The hospitals would form a cooperative organization, offering to the public for an annual, semiannual or quarterly fee ward accommodations with ordinary laboratory, operating room and floor nursing service for all diseases not termed contagious, and all injuries not covered by the workmen's compensation act, for periods of one, two and three months. The cost of the hospital treatment would depend on the period of hospitalization that the beneficiary desired. The necessity for and the duration of the hospitalization would be determined by the patient's physician and one representing the hospital. The patient would select his own physician from the membership of the county society and his own hospital from the list of those cooperating. The plan was originated by Dr. John H. Graves, San Francisco, president of the state board of health and a former president of the state medical association.

DELAWARE

Society News.—At a meeting of the New Castle County Medical Society, Wilmington, November 15, the subject "Rheumatic Fever and Heart Disease" was discussed by Drs. William D. Stroud and Thomas M. McMillan, Philadelphia. Dr. Thomas Turner Thomas, Philadelphia, addressed the society, October 18, on "Reduction of Deformities."

GEORGIA

Society News.—Among others, Dr. Columbus B. Lord, Jefferson, addressed a recent meeting of the Ninth District Medical Society in Jefferson on "Allergic Diseases with Special Reference to Skin Manifestations."——Judge D. R. Cumming spoke on the "Legal Phase of Medical Practice" before the Spalding County Medical Society in Griffin, recently.——The Seventh District Medical Society was addressed in La Fayette, recently, among others, by Dr. John T. McCall, Rome, on "Operative Technic and Postoperative Treatment of the Fulminating Gangrenous Appendix."——Dr. Benjamin H. Minchew, Waycross, among others, addressed the Eleventh District Medical Society in Douglas, October 11, on "Physiology of Vision, Cause of Squint and Its Results," and Major F. Fowler, Atlanta, "Relief of Vesical Neck Obstruction."——Drs. Francis B. Schley and Otis D. Gilliam, Columbus, addressed the Muscogee County Medical Society in Columbus, October 13, on "Fevers of Obscure Origin" and "Ruptured Appendix," respectively.——Dr. Joseph C. Massee, Atlanta, read a paper on "Hypoglycemia Associated with Primary Liver Cell Carcinoma" before the Fulton County Medical Society, November 3.

ILLINOIS

Hospital News.—The new $500,000 St. Charles Hospital, St. Charles, was dedicated, October 23. The building has a bed capacity of 125.

Society News.—Speakers before the Stephenson County Medical Society, Freeport, November 30, included Drs. Albert H. Montgomery, on "Surgery of Acute Abdominal Conditions in Children"; Frederick H. Falls, "Unusual Complications in Pregnancy," and Charles A. Elliott, "Management of Hepatic Disease." The speakers were from Chicago.——Dr. Frank Buckmaster, Effingham, was elected president of the Central Illinois Medical Society at its fifty-seventh semiannual meeting in Pana, November 29.——Among the speakers before the North Central Illinois Medical Society in Pontiac, December 6, were Drs. Emil Z. Levitin, Peoria, on "Postencephalitic Respiratory Syndromes," and Andy Hall, Springfield, state health officer, "Venereal Diseases as a Public Health Problem."——Dr. Bernard Fantus, Chicago, addressed the Kankakee Medical Society and the Kankakee State Hospital staff, December 1, on "Therapy of Colon Stasis."——Dr. Gerry B. Dudley, Charleston, was elected president of the Wabash Valley Aesculapian Society, succeeding Dr. Otto R. Spigler, Terre Haute, Ind., at its annual meeting in Paris, November 2.——Dr. Charles Marshall Davison, Chicago, addressed the Will-Grundy County Medical Society, November 23, on "Recurrent Cholecystitis Following Cholecystotomy."

Chicago

Personal.—Dr. John S. Sweeney has resigned as house physician at the Palmer House after thirty years' service, on account of ill health. Dr. Edward F. Addenbrooke succeeds him.——Dr. Chauncey C. Maher has been appointed assistant professor of medicine at Northwestern University Medical School.

School Room for Sight Saving.—A room especially designed to save eyesight will soon be established in a public school as a gift from the Chicago Woman's Aid in honor of its fiftieth anniversary. According to the Chicago *Tribune*, the room, which is to accommodate about forty children, will be specially lighted and decorated, and special typewriters and other equipment will be supplied. Children's eyes will be tested and fitted with glasses by a physician.

Incidence of Influenza.—According to the health department, until November 1 the number of cases and deaths reported for influenza were below the totals for the same period in 1931. However, during November, fifty-five cases with twenty-two deaths were recorded, as compared with thirty-three cases and thirteen deaths for 1931. For the week ended December 9, seventy-five cases were reported, as compared with eleven for the corresponding period of 1931. Nineteen deaths were noted, as against four for the period in 1931.

Conference on the Depression and Mental Health.—The Illinois Society for Mental Hygiene conducted a conference on the depression and mental health, December 7, with the following speakers:

Dr. Franz Alexander, director, Institute for Psychoanalysis, Reaction Types in the Economic Depression.
Samuel N. Stevens, Ph.D., assistant dean, College of Liberal Arts, Northwestern University, Some Psychological Implications.
Drs. Charles F. Read, managing officer, Elgin State Hospital, and Francis J. Gerty, superintendent, Cook County Psychopathic Hospital, Mental Illness in the Depression.
Dr. Thomas M. French, clinical associate, Institute for Psychoanalysis, Indications and Limitations of Therapy.

Society News.—Edwin O. Jordan, Ph.D., addressed the seventeenth annual meeting of the Institute of Medicine of Chicago, December 6, on some problems in epidemiology.——The Chicago Gynecological Society was addressed, December 16, by Drs. Lloyd L. Arnold on "Relation of Season and Constitutional Type to Menstruation" and William F. Petersen, "Biochemical Alterations and Their Relation to the Menstrual Cycle."——Dr. Evarts A. Graham, St. Louis, delivered the E. R. DeBoth Lecture in Surgery, December 16, at Rush Medical College, on "The Story of the Development of Cholecystography."——At a joint meeting of the Chicago Dermatological Society and the Society of Medical History of Chicago, December 16, Dr. John E. Lane, New Haven, Conn., spoke on "Jean Deveze, Stephen Girard, Benjamin Rush and the Yellow Fever Epidemic in Philadelphia in 1793," and Dr. William Allen Pusey, "Noah Worcester: Pioneer Internist and Dermatologist in the Middle West."

INDIANA

Hospital News.—The new Margaret Mary Hospital, Osgood, was dedicated, October 29; it has accommodations for fifty patients and was erected at a cost of about $150,000.——St. Anthony's Hospital, Terre Haute, celebrated its fiftieth anniversary, September 11-13.

Personal.—Dr. Nathaniel C. Hamilton, Kokomo, has announced his retirement from practice after thirty-two years' service, on account of ill health.——Dr. Frank C. Walker has been promoted to professor of diseases of women and head of the department of gynecology in Indiana University School of Medicine, Indianapolis.——Dr. Elmer C. Singer has been appointed a school physician by the public school board of Fort Wayne.——Dr. Marcus W. Lyon, Jr., South Bend, was elected president of the Indiana Academy of Science, November 25.

Society News.—Dr. William A. McBride, Indianapolis, addressed the Hendricks County Medical Society, October 21, on "Potential Pulmonary Tuberculosis."——The Hamilton County Medical Society, Sheridan, heard Dr. Frank C. Walker, Indianapolis, discuss "Pelvic Infections," October 11.——"Injuries of the Skull and Brain" was the subject of a paper by Dr. Jewett V. Reed, Indianapolis, before the Jasper-Newton Medical Society, October 27.——Dr. Henry J. John, Cleveland, addressed the Muncie Academy of Medicine, November 1, on dietetics and insulin therapy of diabetes.——Dr. George W. Crile, Cleveland, was the guest of honor at a joint meeting of the Tenth District Medical Society and the Lake County Medical Society in Gary, November 10; he spoke on "Care and Treatment of Peptic Ulcers and Diseases of the Thyroid Gland."——Dr. Will W. Washburn, Lafayette, addressed the Adams County Medical Society in Decatur, November 11, on "Tendencies Toward Group and Social Medicine."

LOUISIANA

Personal.—Dr. Rudolph Matas, New Orleans, was recently decorated with the insignia of a knight of the Legion of Honor of France.

Society News.—At a meeting of the Eighth District Medical Society in Alexandria, October 26, speakers included Drs. Noel T. Simmonds, Alexandria, on "Surgical Treatment of Strabismus"; Roy B. Harrison, New Orleans, "Organized Medicine and Its Advantages"; Wells F. Smith, Little Rock, "End-Results of Some Unusual Fractures," and John H. Musser, New Orleans, "Syphilitic Heart Disease."

MARYLAND

Clinics at University of Maryland.—The division of medical extension of the University of Maryland is conducting a series of clinics on Thursday afternoons. The series opened, December 1, with a surgical clinic by Dr. Hugh H. Trout, Roanoke, Va. Dr. Lewellys F. Barker, Baltimore, held a medical clinic, December 8, and Dr. George A. Harrop, Jr., Baltimore, a clinic on myxedema, December 15.

Society News.—Dr. Walter B. Cannon, Boston, was the speaker at the annual meeting of the Baltimore City Medical Society, December 2; his subject was "An Interpretation of the Functions of the Sympathetic Nervous System." The society was addressed, December 16, among others, by Dr. Leonard G. Rowntree, Philadelphia, on "General Aspects of Chronic Arthritis."——Among others, Dr. Thomas B. Aycock, Baltimore, gave an outline of the surgical treatment of tuberculosis before the Allegany-Garrett County Medical Society recently.

Expansion Program at Johns Hopkins Completed.—Dr. Alan M. Chesney, dean of the Johns Hopkins University School of Medicine, announced in his report for the year 1931-1932 the completion of an expansion program which was begun in 1920. The additions and improvements, for which a total of $8,301,272.29 has been expended since that time, included a central power plant, a new nurses' home, improvements to the service building, a pathologic laboratory building, a woman's clinic, the Carnegie outpatient dispensary building, a new wing to the Physiology Building, the Welch Medical Library, the Wilmer Ophthalmological Institute, improvements to the Harriet Lane Home, and the establishment of the Osler and Halsted memorial clinics. The funds that made this expansion possible came from several sources, notably the General Education Board, the Carnegie Corporation, the Wilmer Foundation, Mrs. Lucy Wortham James and an anonymous friend of the university. To make Johns Hopkins a completely rounded organization, it was reported, the major need now is a neurologic clinic and a department of neurology in addition to better facilities for the study of radiant energy in relation to disease and more adequate financial support for the department of psychiatry.

MICHIGAN

Academy of Medicine Formed.—The Battle Creek Academy of Medicine was organized at a meeting of physicians of that city, November 10. The following officers were elected: president, Dr. Joseph E. Rosenfeld; vice president, Dr. Holton M. Lowe, and secretary, Dr. Rollin C. Winslow. The topic discussed at the organization meeting was the unit system of poor relief which will be inaugurated by Battle Creek, January 1, work previously handled by the county.

Society News.—The Wayne County Medical Society was addressed, November 1, by Drs. John G. Slevin, Detroit, on "Massive Abdominal Hemorrhage from Ruptured Graafian Follicle Cysts," and Elisha S. Gurdjian, "Management of Intracranial Injuries."——Dr. Frederick H. Cole, Detroit, addressed the Macomb County Medical Society in Mount Clemens, November 7, on "Present Status of Prostatic Surgery."——At a meeting of the Hillsdale County Medical Society, November 2, Dr. Robert C. Jamieson, Detroit, spoke on "Symptomatology and Treatment of Common Skin Disease."——A symposium on traumatic surgery under the auspices of the Delray Industrial Hospital was conducted before the West Side Medical Society, Detroit, November 3.——Dr. Langdon T. Crane, Detroit, addressed the child guidance division of the Children's Fund of Michigan, October 20, on relation of mental hygiene to medicine, and Dr. David J. Levy, Detroit, November 3, on problems in general pediatric practice.——Among others, Dr. Thelma Freeman, Detroit, discussed endo-

metriosis before the Blackwell Society, October 17.——The Detroit Pediatric Society sponsored a symposium on the endocrine system, November 17.——Dr. William E. Lower, Cleveland, addressed the Calhoun County Medical Society in Battle Creek, November 8, on "The Prostatic Problem from Another Point of View."——Dr. Charles L. Brown, Ann Arbor, addressed the Washtenaw County Medical Society, November 3, on "Pitfalls in the Diagnosis of Chronic Abdominal Disease."

MINNESOTA

Hospital News.—The seventy-fifth anniversary of the founding of St. Mary's Hospital, Rochester, was commemorated, September 15-17.

State Council Meets with Local Societies.—More than eighty physicians attended a regular meeting of the council of the state medical association in joint session with the Upper Mississippi and Stears-Benton medical societies at Little Falls, October 22. Speakers included Drs. Melvin S. Henderson, Rochester, on "Fractures of the Ankle"; William A. Coventry, Duluth, "Office Gynecology in the Treatment of Leukorrhea"; James M. Hayes, Minneapolis, "Cysts of the Neck," and Herbert Z. Giffin, Rochester, "Data and Special Tests Necessary to a Differential Diagnosis of Various Blood Dyscrasias." The council adopted a resolution disapproving of the project of a commercial organization known as the Minnesota Mutual Health Bureau to supply medical care, except hospital costs, to families or individuals.

MISSOURI

Wife of Physician Elected Coroner.—Mrs. William L. Wysong, Liberty, wife of Dr. Wysong, was elected coroner of Clay County at the November election. Mrs. Wysong was her husband's assistant during two terms which he served as coroner. Dr. Wysong is engaged in practice in Liberty.

Clinical Society's New Officers.—At the tenth annual conference of the Kansas City Southwest Clinical Society, recently, the following officers were elected: president, Dr. Peter T. Bohan; vice president, Dr. Michael J. Owens; treasurer, Dr. Herbert S. Valentine; director of clinics, Dr. Earl C. Padgett; associate director of clinics, Dr. Ralph R. Wilson; editor of the society's bulletin, Dr. Rexford L. Diveley, and secretary, Dr. Lewis G. Allen.

Society News.—The following physicians responded to invitations from the graduate committee of the Missouri State Medical Association to deliver addresses at recent meetings of the county medical societies:

Frank R. Teachenor, Kansas City, and E. G. Marks, Nodaway County Medical Society at Maryville, on "Brain Tumors" and "Importance of Early Diagnosis in Bladder Neck Obstruction," respectively.

Lindsay S. Milne, Kansas City, Johnson County Medical Society, at Warrensburg, on "Arthritis."

George H. Hoxie and Ernest Kip Robinson, Kansas City, Jasper County Medical Society at Joplin, on "Diagnosis of Cardiac Arrhythmias" and "Pathology and Treatment of Cancer of the Cervix Uteri," respectively.

William E. Sauer, St. Louis, Marion County Medical Society at Hannibal, "Common Colds and Sequelae."

At the fifty-sixth annual meeting of the Southeast Missouri Medical Association in Fredericktown, October 11-12, Dr. William S. Love, Charleston, was elected president. Dr. George W. Vinyard, Jackson, the only living charter member of the association, was toastmaster at the banquet. Cape Girardeau was selected as the place for the next meeting.——Dr. Alfred W. Adson, Rochester, Minn., spoke on "Trigeminal Neuralgia—Differential Diagnosis and Treatment" before the Jackson County Medical Society, Kansas City, December 13.

NEBRASKA

Society News.—Drs. William L. Shearer and Donald J. Wilson, Omaha, addressed the November meeting of the Madison Six-County Medical Society at Norfolk, on "Surgery of the Jaws with a Survey of Systemic Disturbances Traceable to Infected Teeth and Jaws" and "Common Eruptions of the Mouth and Mucous Membrane," respectively.——Dr. James M. Willis, McCook, among others, addressed the Southwest Nebraska Medical Society at Wauneta, November 10, on spinal anesthesia.

Nebraska Physicians Honored.—Dr. Alexander L. Mathews was the guest of honor at a dinner given by the Custer County Medical Society, October 26, at Broken Bow, marking his completion of fifty years of practice. Dr. Mathews, a native of Pennsylvania, began practice in Calloway in 1886. He was mayor of Calloway for eight years.——Dr. Byron B. Davis, professor of the principles of surgery and clinical surgery at University of Nebraska College of Medicine, Omaha, was honored by a testimonial luncheon by the Omaha Chamber of Commerce, October 31. Dr. Charles W. Poynter, dean of the medical school, delivered the principal address, and a testimonial certificate expressing appreciation of Dr. Davis's services to the city of Omaha was presented.——Dr. Mary MacVean-Edmonds received the 1932 civic award of the Nebraska City Rotary Club in recognition of her services as child welfare worker and city health director.——Dr. William Henry Betz, Bellevue, recently received the local American Legion award for "outstanding service to the community over a period of more than thirty years."

NEW HAMPSHIRE

Society News.—Dr. Francis M. Rackemann, Boston, addressed a meeting of the Hillsborough County Medical Society, October 25, in Manchester, on "Clinical Allergy: Its Nature, Diagnosis and Treatment." Dr. George C. Wilkins, Manchester, discussed various phases of medical economics.——Dr. James R. McCord, Atlanta, Ga., conducted a series of obstetric institutes for physicians in eight counties recently, under the auspices of the state board of health and county medical societies. Two hundred and twenty-four physicians registered and seventy took the entire course, which consisted of five lectures and thirteen reels of motion pictures.

NEW JERSEY

Personal.—Drs. Jackson B. Pellet, Hamburg, and Martin Cole, Hainesville, were guests of honor at a dinner given by the Sussex County Medical Society at Hamburg, October 24. Both have practiced medicine in the county more than sixty years.

Society News.—Dr. Victor D. Washburn, Wilmington, Del., and William T. Hilliard, Salem, addressed the Salem County Medical Society, Salem, October 12, on tumors of the bladder and on eclampsia, respectively.——Drs. Henry Dintenfass, Philadelphia, and Samuel B. English, Glen Gardner, addressed the Atlantic County Medical Society, Atlantic City, December 9, on "Mastoiditis with Special Reference to Diagnosis" and "Collapse Therapy of Pulmonary Tuberculosis," respectively.——A program on problems of the school child was presented before the Camden County Medical Society, Camden, December 6, by Drs. Helen F. Schrack, Albert H. Shafer, Albertos M. K. Maldeis and Benjamin F. Buzby.——Drs. Nathan Rosenthal, New York, and Hyman I. Goldstein, Camden, addressed the Monmouth County Medical Society, Long Branch, November 30, on "Clinical and Hematological Observations on Agranulocytosis" and "Recent Advances in Treatment of Anemias," respectively.

NEW YORK

Personal.—Dr. James J. Chandler, supervisor of tuberculosis hospitals on the staff of the state department of health, resigned, November 15, to enter private practice in Sumter, S. C.

Society News.—Drs. Marion B. Sulzberger, New York, and William Warriner Woodruff, Saranac Lake, addressed the Franklin County Medical Society, Malone, November 2, on "Diagnosis and Treatment of Common Skin Diseases in General Practice" and "Bronchoscopy," respectively. Dr. James N. VanderVeer, Albany, also spoke on medical economics.——Dr. William Sidney Smith addressed the Medical Society of the County of Nassau, Freeport, November 29, on "The First Three Months Postpartum Care."——Dr. Morris Fishbein, editor of THE JOURNAL, addressed the Buffalo Academy of Medicine at its annual dinner, December 7, on "New Forms and Present Trend of Medical Practice."——Dr. Christopher D'Amanda addressed the Rochester Pathological Society, November 17, on "Vascular Diseases of the Extremities."

New York City

Society News.—At a meeting of the International and Spanish-Speaking Association of Physicians, Dentists and Pharmacists, November 18, speakers included Drs. José Goyanes, Madrid, on modern surgery; Felix d'Herelle, New Haven, Conn., behavior of bacteriophage in bacterial disease, and William Seaman Bainbridge, conservation of the human ovary.——A symposium on pneumonia was presented before the Medical Association of the Greater City of New York by Drs. Edward E. Cornwall, Jesse G. M. Bullowa and LeGrand Kerr, November 21.——A symposium on angina pectoris was presented before the Yorkville Medical Society, November 21, by Drs. Albert S. Hyman, who spoke on recent advances in study of the disease; Pol N. Coryllos, surgical treatment; Louis Gaston Labat, paravertebral block anesthesia, and Joseph B. Wolffe, Philadelphia, the use of heart hormone

(tissue extract).——Dr. Harold Neuhof addressed the New York Surgical Society, November 23, on "Diagnosis and Operative Treatment of Acute Phlebitis Complicated by General Septic Invasion."——Dr. Charles Wadsworth Schwartz addressed the New York Roentgen Society, November 21, on early recognition of intracranial disease.——At a meeting of the Medical Society of the County of New York, November 28, speakers were Drs. Edward L. Keyes, on "Prenatal Syphilis—A Plea for Greater Vigilance in the Detection of Syphilis in the Pregnant Woman"; Samuel J. Scadron, "Maternal Mortality in 34,900 Deliveries at the Jewish Memorial Hospital of New York," and George W. Kosmak, "The Relation and Responsibilities of the Obstetric Attendant in the Mortality from Childbearing."

NORTH CAROLINA

Society News.—Among speakers at the annual meeting of the Eighth District Medical Society at Mount Airy, October 28, were Drs. Benjamin E. Pulliam, Elkin, on "Pyloric Obstruction"; Harry L. Brockmann, High Point, "Neurology and the General Practitioner," and Charles O. Delaney, Winston-Salem, "Treatment of Postoperative Peritonitis."

New Medical Building at Wake Forest.—Construction on a new building at Wake Forest College School of Medicine, a gift to the school from the family of the late Dr. William Amos Johnson, was begun in November. The building will be in colonial style to harmonize with older buildings at the college, with two stories and a basement. Dr. Johnson took his academic degree at Wake Forest and, after graduating from the University of Pennsylvania School of Medicine in 1925, returned to his alma mater as professor of anatomy in the medical school. He died, Nov. 26, 1927, of injuries received in an automobile accident. The new structure, to be known as the Johnson Medical Building, will cost $60,000.

OHIO

Personal.—Dr. Andre Crotti, Columbus, has been made a Knight of the Order of the Crown of Italy in recognition of his work among Italian residents of Columbus.——Dr. Ogilvia C. Ricksecker, Wilmot, was appointed health officer of Stark County recently, to take office January 1. He succeeds Dr. Floyd R. Stamp, Alliance.

Society News.—Dr. Samuel A. Levine, Boston, addressed the Montgomery County Medical Society, Dayton, November 29, on "Prognosis in Heart Disease."——Dr. Robert L. Schaefer, Detroit, addressed the Toledo Academy of Medicine, November 18, on "Endocrine Growth Deficiencies."——Drs. Warren C. Breidenbach, Dayton; Joseph C. Placak, Cleveland, and Henry Kennon Dunham, Cincinnati, among others, participated in a discussion of early diagnosis of tuberculosis at a meeting of physicians and health authorities at the Ohio State Sanitarium, Mount Vernon, November 15.——Medical alumni of Ohio State University held a reunion, November 11-12, in Columbus, before the Ohio State-Pennsylvania football game. Clinics were held Friday afternoon and Saturday morning and a dinner was given Friday evening at which Dr. John H. J. Upham, dean of the medical school, was toastmaster.

PENNSYLVANIA

Society News.—Drs. William Minster Kunkel and A. Robert Denison, among others, addressed the Dauphin County Medical Society, Harrisburg, December 6, on "Early Clinical Symptoms Which Suggest Intestinal Obstruction" and "Medical Counterfeits of the Acute Surgical Abdomen," respectively.——At a meeting of the Pittsburgh Pediatric Society, December 9, speakers were Drs. Elwood W. Stitzel, Altoona, on "Rheumatic Infection and Heart Disease in Children"; John M. Lichty, "Convalescent Care of Rheumatic Heart Disease in Children," and George R. Lacy, "Tuberculin Tests."—Dr. Marc W. Bodine and Mr. Thomas F. Dawkins addressed the Lycoming County Medical Society, Williamsport, December 9, on "Some Aspects of Thyroid Disease" and "Health Insurance and the Medical Profession," respectively.

Philadelphia

The Alvarenga Prize.—The College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, amounting to about $300, will be made July 14, 1933. Essays may be on any subject in medicine and should represent an addition to the knowledge and understanding of the subject based on either original or literary research. Each essay must be accompanied by written assurance that it has not been published in whole or in part and that it has not been offered elsewhere in competition for a prize. The college requires that essays be sent without signature but must be plainly marked with a motto and accompanied by a sealed envelop bearing on the outside the motto and inside the name and address of the sender. The prize was not awarded in 1932. Communications should be addressed to Dr. John H. Girvin, secretary, 19 South Twenty-Second Street, Philadelphia.

Society News.—The meeting of the Philadelphia County Medical Society, November 23, was devoted to discussions of tuberculosis. Dr. Lawrence F. Flick gave an address on "The Crusade Against Tuberculosis in Philadelphia," which was discussed by Drs. Theodore B. Appel, state health commissioner, Harrisburg; Charles A. Heiken, Thomas McCrae, William G. Turnbull and Robert G. Torrey. Drs. Francis C. Wood and Thomas M. McMillan presented the Friday afternoon seminar, December 2, on "Heart Pain Other Than Coronary Thrombosis" and "Coronary Thrombosis," respectively.——Drs. Clarence G. Bandler, New York, and Moses Behrend addressed the Philadelphia Urological Society, November 28, on "Transurethral Resection of the Prostate" and "History of Prostatectomy in Philadelphia," respectively.——A symposium on pneumonoconiosis was presented before the section on public health and industrial medicine of the College of Physicians of Philadelphia, December 9, by Drs. Leroy U. Gardner, Saranac Lake, N. Y.; Anthony J. Lanza, New York; Henry K. Pancoast and Eugene P. Pendergrass and Mr. J. J. Bloomfield, sanitary engineer of the U. S. Public Health Service.——At the annual banquet of the alumni association of the Medico-Chirurgical College of Philadelphia, November 17, it was announced that a scholarship fund of $10,000 would become available in 1933 to descendants of graduates of the school. Dr. Edward A. Crueger, Philadelphia, was elected president.

SOUTH CAROLINA

Fifth District Meeting.—The Fifth District Medical Society met at Hobkirk Inn, Camden, November 9, with the following physicians as speakers:

William Allan, Charlotte, N. C., The Hereditary Factor in Hypertension.
Julius H. Taylor, Columbia, The Modern Open Method of Handling Fractures.
Francis Eugene Zemp, Columbia, The Hypertensive Heart.
John W. Corbett, Camden, Mortality in Appendicitis.
James R. Desportes, Fort Mill, Medical Laws as They Affect Us.
James Ralph Dunn, Sumter, Agranulocytic Angina.

TENNESSEE

Health Council Appointed.—At the request of Dr. Eugene L. Bishop, state commissioner of health, Governor Horton has appointed a public health council to act in an advisory capacity to the state board of health. The members of the council are Drs. William C. Dixon, Nashville; John Owsley Manier, Nashville; George C. Williamson, Columbia; Lloyd M. Graves, Memphis, and Thomas B. Yancey, Kingsport.

Society News.—Dr. Oval N. Bryan addressed the Nashville Academy of Medicine, November 22, on agranulocytosis.——Dr. Lonnie D. Allen, Smithville, was elected president of the Middle Tennessee Medical Association at the annual meeting in Columbia, November 10-11, succeeding Dr. Worcester A. Bryan, Nashville. Among other speakers were Drs. Willis C. Campbell, Memphis, on "The Fracture Problem"; Horton Casparis, Nashville, "Acute Respiratory Infections in Children" and William R. Cate, Nashville, "Diagnosis and Management of Anemia."——Dr. Henry G. Hill, Memphis, addressed the Knox County Medical Society, Knoxville, November 15, on treatment of fractures of the shaft of the femur.——Dr. Raphael E. Semmes, Memphis, among others, addressed the Gibson County Medical Society, Trenton, October 31, on tumors of the brain.——Dr. Edward T. Newell, Chattanooga, addressed the Blount County Medical Society, November 3, on "Radiation and Surgical Treatment of Benign Uterine Hemorrhage."——Dr. John S. Lundy, Rochester, Minn., addressed the Chattanooga and Hamilton County Medical Society, December 8, on anesthesia.

VIRGINIA

Hospital News.—A new unit recently completed at the Southwestern State Hospital, Marion, at a cost of $100,000, will accommodate 100 additional patients.

Appointment to State Board.—Dr. Robley D. Bates, Newtown, has been appointed by Governor Pollard to fill out the unexpired term as a member of the state board of medical examiners of Dr. John H. Ayres, Accomac, who recently resigned. The term will run until April 1, 1934.

Personal.—Dr. James B. Stone, Richmond, was elected president of the Virginia Pediatric Society at the annual meet-

ing in Richmond, November 2.——Dr. William J. West, Richmond, has been made surgeon in chief to the Virginia State Farm, succeeding the late Dr. Thomas M. Taylor.

WASHINGTON

Hospital News.—Dr. Lionel E. Hooper, U. S. Public Health Service, has been named superintendent of a new $1,750,000 Marine Hospital in Seattle. It is expected that the hospital will be occupied in January.

Society News.—Dr. Charles E. Watts addressed the King County Medical Society, Seattle, December 5, on cardiac asthma. Dr. Paul A. O'Leary, Rochester, Minn., addressed the society, November 14, on visceral syphilis.——Dr. Alexander H. Peacock, Seattle, president, Washington State Medical Association, addressed the Walla Walla Valley Medical Society, November 9, on medical economics.

WISCONSIN

Health Center Opened.—The Matthew Keenan Memorial Health Center, a gift to the city of Milwaukee by the late Matthew Keenan, was opened, September 10. It cost $150,000.

Personal.—Dr. Ernest L. Schroeder, Shawano, has been appointed a member of the board of visitors of the University of Wisconsin for a term of four years.——Masons of New London held a special meeting, November 15, in honor of the eightieth birthday of Dr. George T. Dawley, who has been an officer of the order for forty-nine years.

Society News.—Dr. Olin West, Chicago, secretary and general manager of the American Medical Association, addressed the Medical Society of Milwaukee County, December 8, on "Current Medical Problems." Dr. Arthur W. Erskine, Cedar Rapids, Iowa, gave the initial lecture in the graduate course on roentgenology, December 5.——Dr. Willard O. Thompson, Chicago, will address the Milwaukee Academy of Medicine, December 20, on "The Iodine Reaction in Exophthalmic Goiter."——Drs. Laurence A. Cooley, Dubuque, Iowa, and Erwin R. Schmidt, Madison, addressed the Grant County Medical Society, Lancaster, November 15, on coronary thrombosis and mortality in acute appendicitis, respectively.——Dr. Frank G. Connell, Oshkosh, addressed the Winnebago County Medical Society, November 18, on "Postoperative Ulcers of the Stomach."——Dr. Louis M. Warfield, Milwaukee, addressed the Outagamie County Medical Society, Appleton, November 15, on "The Irregular Heart and Its Treatment."——Dr. Claude F. Dixon, Rochester, Minn., was the guest speaker at the annual meeting of the Tri-County Medical Association (Trempealeau, Buffalo and Jackson counties) in Galesville, November 17, on "Latest Improvements in Surgical Technic."

GENERAL

Public Health in President's Message.—President Hoover in his annual message to Congress, December 6, stated that the public health is today at its highest known level. Information furnished by the surgeon general of the U. S. Public Health Service showed that the mortality rate per thousand of population on an annual basis from representative states for the first nine months of 1932 was 10.6. This compares with 11.2 for the same period of 1931 and 11.9 for the same period in 1928.

Annual Sale of Tuberculosis Christmas Seals.—The National Tuberculosis Association this year is conducting its twenty-sixth annual sale of Christmas seals. Funds derived from this source support the campaign against tuberculosis carried on during the year by the more than 2,000 state or local associations in the United States. Although since 1906 there has been a reduction of 50 per cent in the tuberculosis death rate for the country as a whole, there are still 85,000 deaths each year in the United States and 500,000 persons ill with the disease. The twenty-ninth annual meeting of the National Tuberculosis Association will be held in Toronto, June 26-30, 1933.

Dr. Menville Receives Radiological Medal.—Dr. Leon J. Menville, assistant professor of medicine and roentgenology, Tulane University of Louisiana School of Medicine, New Orleans, was awarded the gold medal of the Radiological Society of North America at its annual meeting in Atlantic City, November 28-December 2. The medal was given for Dr. Menville's work on the investigation of the alimentary tract of rachitic rats and also for the visualization of lymphatic glands. Dr. W. Herbert McGuffin, Calgary, Alta., Canada, was named president-elect of the association at this meeting, to take office Jan. 1, 1934. Dr. Byron H. Jackson, Scranton, Pa., will assume the presidency of the society, January 1. The next annual session will be held in Chicago, September, 1933, as a part of an international congress on radiology.

Council to Study Committee Recommendations.—A Council on Community Relations and Administrative Practice has been appointed by the American Hospital Association to undertake an immediate study of the recommendations of the Committee on the Costs of Medical Care, calling for changes in existing relations between hospitals, the medical profession and the public, the New York *Times* reports. Members of the newly formed council include the following:

Dr. Sigismund S. Goldwater, New York, chairman.
Dr. George Harvey Agnew, Toronto.
Dr. Benjamin W. Black, Oakland, Calif.
Dr. Robin C. Buerki, Madison, Wis.
Michael M. Davis, Ph.D., of the Julius Rosenwald Fund, Chicago.
Dr. Joseph C. Doane, Philadelphia.
Rev. Maurice F. Griffin, Cleveland.
Dr. Alfred K. Haywood, Vancouver General Hospital, Vancouver, B. C.
Mary L. Hicks, Norton Memorial Infirmary, Louisville, Ky.
Dr. Basil C. MacLean, Touro Infirmary, New Orleans.
Ada Belle McCleery, Evanston Hospital, Evanston, Ill.
Dr. Claude W. Munger, Grasslands Hospital, Valhalla, N. Y.
Dr. Watson S. Rankin, Duke Endowment, Charlotte, N. C.
Dr. Winford H. Smith, Johns Hopkins Hospital, Baltimore.
Dr. Frederic A. Washburn, Massachusetts General Hospital, Boston.

Veterans' Bureau Builds Ten New Hospitals.—Hospitals and additions to hospitals providing 7,190 beds at a cost of about $15,750,000 are now under construction in twenty-four cities by the Veterans' Administration, according to a recent survey. These new hospitals and additions are going up at:

Aspinwall, Pa.	Coatesville, Pa.	Oteen, N. C.
Augusta, Me.	Columbia, S. C.	Roseburg, Ore.
Batavia, N. Y.	Danville, Ill.	Rutland, Mass.
Bedford, Mass.	Des Moines, Iowa	Sheridan, Wyo.
Biloxi, Miss.	Fayetteville, Ark.	St. Cloud, Minn.
Canandaigua, N. Y.	Fort Harrison, Mont.	St. Petersburg, Fla.
Cheyenne, Wyo.	Leavenworth, Kan.	Tuskegee, Ala.
Chillicothe, Ohio	Minneapolis, Minn.	Wichita, Kan.

Some of the buildings are for domiciliary care only and others are strictly hospitals. Ten are new hospitals. A review of the comprehensive program of the administration shows that from September, 1930, to August, 1932, contracts were awarded for fifty-three major projects providing 12,608 beds and involving an estimated expenditure of $29,700,000. It is pointed out that reduced construction costs during the past two years have made it possible to acquire approximately three times as many beds at slightly over twice the expenditure recorded during the period from September, 1928, to August, 1930. The program submitted as a basis of the general authorization act of 1931 making available $20,877,000 contemplated the acquisition of 7,477 beds; the cost of construction approved thus far is $16,783,310, for which it is expected that 7,684 beds will be acquired. The average number of beds under construction during the past two years was 4,916, as compared with an average of 2,523 for the previous two-year period. The estimated number of persons employed on the major projects during same period was 2,658 as compared with 1,739 for the preceding two years.

Government Services

Army Personals

Major Frank D. Francis and Capt. Charles S. Sly, having been found by an army retiring board incapacitated for active service on account of disability incident thereto, their retirement has been approved by the President; Capt. James P. Cooney, assigned at U. S. Military Academy, West Point, New York, on completion of foreign service; Major Paul E. McNabb, assigned to duty in the Philippine Department.

U. S. Public Health Service

Acting Asst. Surg. Charles E. Duffin, relieved at Louisville, Ky., and assigned at the marine hospital, Memphis, Tenn.

Acting Asst. Surg. George I. Baker, relieved at Memphis and assigned at the marine hospital, Ellis Island, N. Y.

Asst. Surg. John W. Oliphant, relieved at San Francisco, and assigned with the coast guard at Juneau, Alaska, on the C. G. Cutter *Tallapoosa*.

Acting Asst. Surg. Marshall C. Sexton, assigned at marine hospital, San Francisco.

Passed Asst. Surg. (R.) Carroll E. Bingman, assigned at marine hospital, San Francisco.

Medical Director Dana E. Robinson, relieved at Ottawa, Canada, and assigned as director of district number 3, Chicago.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 19, 1932.

Consultants and Specialists for Panel Patients

The national insurance system provides only a general practitioner service for panel patients. The provision of a consultant service has often been discussed but the financial depression has proved a barrier. Panel patients can of course obtain the services of consultants by paying for them, and the British Medical Association has prepared a scheme by which this can be done at a modified fee. The closest cooperation will be maintained with the patient's panel physician, whose approval will be necessary and to whom the consultant's opinion will be communicated. A consultant's list of consulting physicians and surgeons in London whose advice will be available for a fee of $5 has been drawn up by the association. The list contains more than 400 names and includes every kind of specialist. A similar reduction of fee has always been possible for necessitous patients. But the scheme has the advantage that the attending practitioner will not have in each case to correspond with the consultant in order to arrange for a reduced fee. At present either this is done or the patient attends the outpatient department of a hospital and the consultant receives nothing for his services. Under the scheme the patient will be saved the great waste of time involved by attendance at a hospital. A number of benefit societies have already established for their members a list of consultants willing to see members at a reduced fee. But the British Medical Association objects to such lists on the following grounds: 1. The list is a closed or restricted one, controlled by a nonmedical organization. 2. The circulation to members of a particular society as to the arrangements is contrary to the dictum of the General Medical Council. 3. There is no income limit, except so far as this is represented in the status of the particular society. In view of the list of consultants established by the association, on which all physicians who satisfy the required criteria may be placed, it is hoped that such closed panels will be abolished and that physicians associated with them will have their names removed.

The Treatment of Acute Appendicitis

A discussion at the Royal Society of Medicine showed how much authorities differ on several points in connection with the treatment of acute appendicitis. The discussion was aroused by an address given earlier in the year by the veteran surgeon Sir James Berry, at the Medical Society of London, entitled "Fallen Idols," in which he maintained that better results were obtained by restricting operation. In opening the discussion, Dr. J. A. Ryle of Guy's Hospital stated that the foremost cause of mortality was still delay in diagnosis, while the most dangerous type and the type most often missed was Wilkie's obstructive type, which required immediate operation. It was characterized by severe pain not accompanied by inflammatory symptoms such as pyrexia, increased pulse rate or rigidity. In the inflammatory type expectant treatment might be justifiable; intervention in the "middle period" might be dangerous and cause spread of infection or ileus. His recommendations were: (1) for the inflammatory case, the interval operation or expectant treatment; (2) for abscess, drainage at the most favorable moment; (3) for the obstructive or gangrenous type, immediate operation; (4) for the late case with distention and signs of obstruction, a consultation.

Mr. H. H. Rayner, surgeon to the Royal Infirmary, at Manchester, protested against the suggestion that surgery was making no progress because the mortality rate had been steady for twenty years. The case mortality had been halved in that period. In practice the fundamental question was, Has this patient acute appendicitis? This was more important than Has he obstructive appendicitis? The public needed some knowledge of early symptoms. Early operation under proper conditions reduced the risk of death from 14 to 1 per cent. Patients seen on the third day for the first time were a different problem. There were three types; the subsiding, localized peritonitis, and widespread peritonitis. In general peritonitis, operation should be performed at once. About half the cases with local peritonitis would settle down but must be watched carefully lest the chance be lost. He recommended expectant treatment for (1) cases of localized muscular rigidity, and (2) those presenting a palpable mass. Indications for immediate operation were (1) recent exacerbation of pain, (2) acute tenderness and (3) toxemia.

Mr. Herbert Brown stressed the risk of operating on an apparently simple abscess in the middle of the first week. Until the end of this week there was no general immunity, and swabbing the cavity might disturb the layer of protecting lymph and cause fatal septicemia.

Mr. Zachary Cope was certain that there were cases in which it was better to wait. If the appendix had perforated and there was a lump, the resistance of the patient was combating it and the lump was steadily decreasing, operation would give better results after a few days of semistarvation and rectal fluids. Delay was also helpful for general peritonitis, as a limited operation might become possible. Ileus with a rapid pulse should be treated expectantly with gas gangrene serum.

Only one surgeon, Mr. A. J. Walton of the London Hospital, advised urgent operation in all cases, with the one exception of the very fat patient, who was a bad risk for any operation. He did not believe that there was such a thing as a "subsiding appendix"; it might perforate at any time. The danger of spreading infection from a localized abscess could be overcome by proper technic.

Increase in Tuberculosis Among Girls

It has been reported in a previous letter that in spite of the general decline of tuberculosis in this country the disease has recently increased in young unmarried girls. In a report just issued, Dr. Ronald Walshaw and Dr. Gordon Smith, county tuberculosis officers for Worcestershire, point out that deaths from tuberculosis in women between the ages of 20 and 25 have failed to decline as the rate has for other ages. They attribute the prevalence of tuberculosis in young women to their habits. In a manufacturing town in the county, where girls are employed, the usual procedure is for them to hurry from work, partake of an insufficient meal, and then rush off to the cinema or dance hall. In a waiting list for beds at one of the county's sanatoriums, twenty-five out of twenty-nine persons are women.

Inferiority of Women as Aviators

Tests carried out by the central medical board of the air ministry show that the capacity of women for flying is definitely less than that of men. To qualify for a commercial license for flying, pilots have to be examined by the board. Spirometric tests show that while the vital capacity of the average pilot is 5 liters, women pilots average only 4. The ideal pulse for an air pilot is 60 per minute, and long distance pilots have a much lower pulse. Women rarely have a pulse as low as 60. Allowance is made for these differences, but in all other respects the tests for men and women aviators are identical. In the revolving chair, women pilots have not shown themselves inferior to men by suffering more readily from giddiness. For flying at high altitudes women aviators are at the greatest disadvantage, because their vital capacity is less than that of men and therefore they have more difficulty in breathing the rarefied air. A number of women fly privately for pleasure. They can do this with the amateur A license, which is granted on their own physician's certificate after

approval by the air ministry. The amateur pilot can fly when she likes and choose her own weather, but the commercial pilot cannot and for flying must obtain the B license. Few women have qualified for this certificate. The only difference between the regulations for men and for women who hold this license is that the latter must submit to reexamination every four months, the former every six months. It is interesting to recall that in the first two years of the war there were no medical tests for airmen beyond the general medical examination of all recruits. Accidents worked out at the rate of one for every fifty flying hours and one fatal crash for every 500 hours. Now, because of the selection by the tests of the air ministry there is only one fatal accident for flying a distance equal to fifty times the circumference of the earth.

A Radium Needle in the Heart

The Royal Free Hospital, London, reports a case in which a radium needle was accidentally displaced when used for the treatment of cancer of the breast. The needle found its way into the heart, where is remained for nearly three years. As a result, the patient died. A large cancerous tumor was found in the liver, and its nature suggested that the radium gave rise to it. The original cancer had been destroyed.

The Hormone Test for Pregnancy

The report of the Pregnancy Diagnosis Station of the University of Edinburgh for the year ended January 31, which has just been published shows that 1,477 cases have been dealt with, as against 835 and 840 in the preceding years. Of these, 824 were controlled by clinical diagnosis and the correctness of the test was confirmed in 96.61 per cent. The 3.39 per cent in which the diagnosis differed are not to be regarded as the real error of the method, as a positive reaction may be obtained in the absence of a living fetus in the presence of other living products of conception. Conversely, a negative test may be obtained in the presence of clinical signs of pregnancy when the secretory products of conception have died without expulsion of the fetus. The real error is therefore assessed as 2.67 per cent. The prognosis for uneventful termination of pregnancy is not favorable in cases in which the test is negative although there are clinical signs of pregnancy. The station has used Friedman's test, in which rabbits are substituted for the mice of the original test of Aschheim and Zondek, because they are more easily obtained. It has been found not quite so reliable as the original test, though a positive result may be regarded with confidence.

Nutritional Anemia of Infants

The Ministry of Health has addressed a letter to local authorities and maternity and child welfare centers, stating that nutritional anemia in infants living under conditions of city life is due to deficiency of available iron and possibly also copper. The important feature is susceptibility to infection, particularly a liability to colds, otorrhea, bronchitis and enteritis. There is ample evidence that the administration of iron ammonium citrate to infants or the feeding of them with milk to which iron has been added considerably reduces the incidence of nutritional anemia and raises resistance to infections.

Dr. Helen Mackay found that nutritional anemia was extremely common in the children of the poor in the east end of London. Only 10 per cent of artificially-fed infants and 16 per cent of the breast fed showed a hemoglobin concentration of 80 per cent or more, after the age of 5 months. That the main cause of this anemia was a deficiency of iron, and possibly also of copper, was shown both by animal experiments and by clinical experience. Nutritional anemia was produced in young animals by feeding them after weaning exclusively on milk, and in infants it could be cured by the addition of iron with traces of copper. The iron content of cow's milk is lower than that of human milk and is not sufficient to supply the infant's needs after it has exhausted the iron stored in its liver at birth. Iron and ammonium citrate was given to the children either as a mixture or incorporated in the dried milk in the proportion which gave 4½ to 9 grains (0.3 to 0.6 Gm.) daily. This preparation has been shown to contain traces of copper, to which part of the effect may have been due.

PARIS

(From Our Regular Correspondent)

Nov. 9, 1932.

The French Congress of Surgery

The forty-first French Congress of Surgery, held in the Great Hall of the Faculté de médecine, was attended by Mr. Justin Godart, minister of public health, and was presided over by Prof. Pierre Duval. The attendance was large and included many members from foreign countries. The Congress of Surgery is the most brilliant of the numerous congresses that assemble in Paris after the vacation period is over. The president described the complex training needed by a surgeon, which should include knowledge of borderline subjects in order that he may not be dependent on specialists: histologists, physiologists, radiologists. He took up the question of a special diploma in surgery proposed for the benefit of truly competent surgeons, a delicate question, which has already been rejected by the council of the Faculté de médecine and by the medical syndicates but which Duval declares is needed in order to protect the public and exclude from surgical practice physicians who have not specialized in surgery; but that is precisely why such a diploma has always been rejected. After the reading of the report of the general secretary, Dr. Grégoire, and a short address by the minister of public health, a past president of the society, the discussion was opened on the three topics on the regular program.

SURGERY OF THE HEART

A paper by Professor Lenormant of Paris and Leriche of Strasbourg constituted an epitome of the present state of surgery of the heart. Interventions performed on the heart itself and the valvular orifices are as yet in the experimental stage, although great hopes have been awakened for the future. Lenormant discussed the surgical treatment of chronic pericarditis, which may be divided into two groups: To the first belongs adhesive mediastinopericarditis, in which the lesions extend beyond the pericardium and cause the fibrous sac of the pericardium to adhere to the diaphragm and to the pleurae. To the second group belongs pericarditis callosa, more frequent and more grave, in which the lesions on the visceral layers predominate, forming a thick, inelastic matrix about the heart. Clinically, mediastinopericarditis is characterized chiefly by systolic retraction of the costal wall and fixity of the apex beat, whereas pericarditis callosa causes chiefly phenomena due to venous stasis (enlarged liver, ascites, edema). But it is seldom that the two types are so frankly differentiated. Hence, it is difficult to establish the diagnosis and to determine the operative indications.

Lenormant discussed then the particular indications for the various interventions proposed for the treatment of chronic pericarditis: precardiac thoracectomy, the Brauer operation, pericardectomy and phrenicectomy. The first intervention is relatively benign (it results in 35 per cent of deaths during the first year). The second intervention is more grave (45 per cent of mortality), but the chances for enduring betterment are much greater. Phrenicectomy is confined to adhesions of the pericardium to the diaphragm. The decision as to the intervention should be reached through close collaboration of the heart specialist and the surgeon. In the second part of the paper, Leriche and Fontaine discussed surgery of the nervous apparatus of the heart. Considering the important rôle that lesions of the coronary arteries play, they expressed the view that one can apply here the same physiologic data as to spas-

modic arteritis of the limbs and institute resections of the sympathetic fibers, which they verified experimentally. They discovered that the stellate ganglion and the ganglions of the cardiac plexus were the points of origin of the cardiac vascular reflexes. Experiments on animals having shown the effects of ligation of the coronary arteries, they removed the stellate ganglion to cause vasodilatation of those arteries, as is accomplished by arterial sympathectomy in Bürger's disease. Leriche reported statistics on eighty-two cases of angina pectoris so treated, eleven of which were his own cases. Nerve resections done above the stellate ganglion furnish 58 per cent of recoveries, while resection of the stellate ganglion yields 75 per cent. During the discussion, Professor Vaquez spoke on the treatment of stenoses, admitting that the results have not been especially satisfactory; he thought that surgery would in the future obtain better results. In pericarditis, he gives his approval to thoracectomy. Mr. Danielopolu of Bucharest disapproved the Leriche method and expressed his preference for sympathectomy with resection of the rami communicantes. Lian and Welti proposed left stellectomy and section of the middle cardiac nerve under local anesthesia. Paschoud of Lausanne expressed doubts as to the results of the operations as performed by Leriche and by Danielopolu. No precise conclusions supported by the majority of the assembly developed from these discussions.

SURGICAL TREATMENT IN DISEASES OF THE BLOOD

The paper of Grégoire and Santy was a comprehensive study on the opportunities for surgical intervention on the spleen in diseases of the blood. Such interventions give excellent results in conditions resulting from an abnormal destruction of the elements of the blood; especially in hemolytic icterus (93 per cent of recoveries), but less certain results in pseudohemophilia, in which other factors besides the spleen may play a part in the etiology. In pernicious anemia splenectomy has lost many of its indications since the discovery of the medical treatment of Whipple and of Castle. Splenectomy may, however, help in some rebellious cases the action of these forms of treatment. Under a second heading, certain diseases in which the system producing the component elements of the blood is affected were considered; in these the use of surgery is doubtful: polyglobulism, leukemia and pernicious anemia. To attack the spleen in these conditions is nonsense. During the discussion Mr. Fiessinger emphasized the necessity of functional tests of the liver preceding splenectomy, especially the galactose tolerance test. Mr. Aubertin expressed the view that the indications for splenectomy are more numerous than formerly. Mr. Alessandri of Rome performs ligation of the splenic artery when splenectomy proves impracticable owing to the presence of adhesions or the poor general condition of the patient. Leriche referred to cases in which the spleen, after removal, showed no histologic lesions and was reserved as to the prognosis of the operation.

CHRONIC ARTHRITIS OF THE HIP

Cunéo of Paris and Rocher, in their paper, discussed the various processes that lead to arthritis deformans of the hip (excluding tuberculous arthritis) and constitute congenital lesions. Abnormal abrasion of the articular surfaces, with a process of repair at the periphery of the joint, constitutes the essential condition. The authors discussed the various operations that have been proposed, including osteotomy, use of grafts, arthroplastic resections, orthopedics, thermotherapy and radiotherapy. More and more, arthritis deformans, a disease that was formerly solely medical, is becoming amenable to surgery when other methods have failed. The two most common forms of major operations, arthrodesis and mobilizing operations, are of equal gravity, although extra-articular arthrodesis is slightly less grave. Reconstruction operations are not considered before the end of adolescence and are not used in treating the aged. The three objects to be attained are stabilization, mobility and freedom from pain. In the discussion, Mr. Calot emphasized the important part played by congenital subluxation, which one often fails to recognize owing to a wrong interpretation of roentgenograms. Mr. Tavernier of Lyons reported the results of his technic and recommended arthrodesis in the aged and arthroplasty in young patients. Mr. Pieri of Belluno favored the use of successive series of plaster casts. A large number of communications on kindred subjects completed this comprehensive program. Mr. Perey of St. Malo pointed out the remarkable sedative effects of injections of alcohol into neoplasms that are directly accessible. Mr. Sorrel of Neuilly disapproved the use of tincture of iodine for preoperative disinfection of the skin and recommended the repeated use of soap and water as preferable. Proust and Maurer described their technic for thoracoplasty and apicolysis. Calot of Berck pointed out that osteochondritis is only an unrecognized congenital luxation of the hip. Mr. Antonopoulos of Athens described his method for the cure of vesicovaginal fistulas.

A session was devoted to showing slides and films. Mr. Bérard of Lyons presented a beautiful film on the technic of thyroidectomy. Mr. Roederer exhibited a film on spondylolisthesis; Mr. Dartigues another on total bilateral mammectomy with a graft of the areola and the nipple; Mr. V. Pauchet one on the surgical treatment of gastroduodenal ulcers, and Mr. Bourguet one on the esthetic surgery of the eyelids.

At the close of the congress, Mr. Leriche was elected president for the next session, and Mr. Cunéo vice president. The topics chosen for the program are: "Surgery of the Parathyroids," to be presented by Welti of Paris and Yung of Strasbourg; "Surgical Treatment of Closed Fractures of the Base of the Cranium," by Lenormant of Paris and Wertheim of Lyons, and "Surgical Treatment of Hemorrhages of Gastroduodenal Ulcers," by Wilmoth of Paris and Papin of Bordeaux.

BERLIN

(From Our Regular Correspondent)

Nov. 14, 1932.

Discovery of Cause of the Haff Disease

During the years 1924 to 1926 a peculiar disease, characterized by hemoglobinuria, muscular weakness and pains in the limbs, appeared among the population living on the banks of the Haff, an arm of the Baltic Sea, in East Prussia. In September, 1932, the disease reappeared in villages along the Haff, this time as well almost exclusively among the fishermen. In 1926 the Verein für wissenschaftliche Heilkunde of Königsberg reported the results of experiments carried out by members of the faculty of the University of Königsberg, which appeared to justify the conclusion that the disease was transmitted by eating eels that had ingested toxic material in mud derived from the waste waters of Königsberg cellulose factories. With the reappearance of the disease this year, members of the Königsberg medical faculty instituted a new investigation of this mysterious disorder, the results of which were reported, November 7, before the Königsberg Verein für wissenschaftliche Heilkunde. Professor Stoeltzner, director of the Kinderklinik, isolated from the waste waters a resin acid that was derived from the fir wood used in the manufacture of cellulose. This acid passes with the waste waters of the cellulose factories into the municipal sewer system and thence into the Haff, where, owing to its colloidal nature, it sinks to the bottom of the Haff and is converted into resin soap. By experimentation Stoeltzner succeeded in developing an artificial disorder in eels procured from aquariums, and the Haff disease developed in cats that ate these eels. Likewise, the pharmacologist Professor Eichholtz, by feeding experiments applied to perch-pike derived from the Haff, reached corresponding results. Professor Willer thinks that the brackish condition of the water furnishes an explanation why this disease of fish could develop in the Haff under the influence of the poisonous substances

entering it. On the basis of these facts there can be no doubt that the Haff disease originates under definite environmental conditions affecting the fishing population, by the ingestion of large quantities of fish that have developed a disorder through toxins derived from waste waters of cellulose factories. The theory of an infectious disease, which was suggested, has been refuted. No danger threatens the population of East Prussia through the customary eating of fish in municipal households. It is believed that the prophylactic measures to be instituted will cause the Haff disease soon to be forgotten.

Considerable excitement has been precipitated among the fishing population, not only because of the disease but also because the people have stopped buying fish. The fishermen threaten that, if the matter is not speedily remedied, they will fill the channel that carries the waste waters into the Haff.

Petition of University Instructors to President von Hindenburg

Mention has been made in these letters of the distressing effects of the existing economic situation on the progress of science. The situation is worse than is commonly supposed. Statements may frequently be heard from directors of university institutes to the effect that the appropriated monies at their disposal will be exhausted by the end of the year, whereas these constantly reduced sums are supposed to suffice until the close of the fiscal year, or until April 1.

The result will doubtless be that many scientific institutes will be compelled to limit their research and may be forced to close for a time, although the courses of instruction would have to be maintained. In this situation, a most unusual step has been taken. Eminent research workers in all fields, constituting a list of 140 names of men of science, have sent directly to President von Hindenburg an appeal for the preservation of scientific research. They point out that the Notgemeinschaft der Deutschen Wissenschaft and the celebrated Kaiser-Wilhelm-Geselischaft zur Förderung der Wissenschaften, with their institutes that are known throughout the world, are being embarrassed in their research work by the lack of funds. They emphasize that any further reduction in their appropriations would be unendurable. They state that the amounts granted to these societies are only a small proportion of the whole federal budget, and that increases within possible limits would "assure the most necessary progress of research." It must be emphasized that the work in the fields of art and science—from the researches of the academies down to the work of independent individuals—must be consecutive in order to be of value. It is not a simple matter that, when funds are not available, a research institute can be allowed to lie idle for a time, a scientific journal can be permitted to discontinue publication, or a scientific society can be allowed to struggle along until better times appear. It is, on the contrary, unquestionably true that the sums withdrawn, during hard times, from intellectual fields must be restored, twice and thrice over, at other points, in order to compensate even partially for the damage caused.

Census of Venereal Patients in Berlin

The census of venereal patients in Berlin, undertaken by the Gross-Berliner Aerztebund in June of this year, revealed a decrease in gonorrhea of more than 20 per cent, and in syphilis of more than 40 per cent, as compared with the census taken in June, 1930. As against the census of June, 1927, gonorrhea had decreased by 40 and syphilis by 60 per cent. In the public consultation centers, however, gonorrhea has increased by 20 per cent, whereas syphilis has decreased by 20 per cent. Chancroid reached its highest incidence in 1928, since which time it has greatly decreased (a reduction of 75 per cent since 1927). Two deductions may be made from these statistics: a marked decrease in the number of gonorrheal patients encountered in private practice, and a considerable increase in the number of patients who present themselves at the public consultation centers; a greater decrease in syphilitic patients treated by general practitioners than in the number who present themselves at the public consultation centers. This fact is doubtless to be explained by the circumstances that at the public consultation centers the patient receives the needed medicaments without charge, whereas the patient who consults the panel physician must not only pay for the sick certificate but also 50 pfennigs, or 12 cents, for the medicines required.

ITALY

(From Our Regular Correspondent)

Sept. 30, 1932.

Congress on the Medical Aspects of Work

The tenth Congresso nazionale di medicina del lavoro was held at Milan, at the university, under the presidency of Professor Devoto.

INTELLECTUAL WORK

The official speakers on the first main topic, "Intellectual Work," were Prof. Luigi Ferrannini, clinician at the University of Bari, and Prof. Sante De Sanctis, psychiatrist of Rome. Ferrannini demonstrated that the nervous impulse is accompanied, if repeated, by manifestations of fatigue that cannot be ascribed solely to mental functions but find their expression also in various organs and systems. Nerve tissue is highly resistant to fatigue, but fatigue may cause true changes that at first are only functional. Numerous researches on the behavior of the pulse, the peripheral capillary circulation, the respiratory rhythm, the gastric secretion, and the like, have shown clearly that cerebral work may influence all the functions of the human organism. There is also a true nervous exchange, for it has been demonstrated that the nervous impulse is accompanied by the development of heat, whereas formerly it was held that nervous activity manifested itself solely by means of action currents. It has been shown that basal metabolism and the exchange of phosphorus, carbohydrates and proteins undergo changes, which affect the calcium, the potassium and the chlorine content of the blood. Following mental work, changes in the leukocytes are observed. Mental work, however, cannot be evaluated in terms of calories and kilogrammeters. Viale compares muscular activity to a fire that produces heat and a residue of ashes, whereas cerebral activity is like an imponderable light; the lamp (the nerve cells) that produces it is well known but the mode of origin is a mystery. Some do not admit that mental work causes fatigue, arguing that the nerve centers are inexhaustible and have within themselves the power of constant reintegration. But, even so, it must be admitted that there is a process of consumption and a process of reparation. The brain is rich in lipoids, which have a high caloric value, and the oxidation of the most minute quantity of this material is sufficient to liberate a large amount of energy. Professor Ferrannini admitted that intellectual work causes fatigue.

Professor De Sanctis contended that mental work, in its pure form, does not cause fatigue. In mental work there are two components, a purely psychic factor and a biologic factor. Associated with mental work there is always some muscular work and it is that which causes the fatigue. De Sanctis sought to recognize and measure these two factors by constructing the curves of mental work, from which he derived the "curve of pure mental work." There are numerous factors that influence mental work and may produce fatigue. To obtain the maximal value it is necessary for the intellectual worker to be in the best physical and mental condition; he must also take account of the position of the body during the work and must see to it that he makes the necessary pauses and takes proper periods of rest. The speaker is opposed to the so-called *scuola gioiosa*, a school in which study is a "constant joy," for the school should be a preparation for life, and life is a struggle. The discussion was participated in by Professors Foà, Viale, Devoto and Pieraccini.

AGRICULTURAL WORK

The second topic, "Agricultural Work," was discussed by Dr. G. Caso of Naples and Prof. G. Ajello of Milan. Caso brought out that the posture assumed by agricultural workers causes, in time, various skeletal changes, particularly of the spinal column; lesions such as varicose veins in the lower limbs, and hemorrhoids; likewise ptoses of the abdominal viscera. Favism, so frequent among agricultural workers, is of a toxic nature. The light, the temperature, the humidity, the nature of the soil, the hygienic conditions of rural dwellings, the stables, fertilizers, and the like, are factors that enter into the cause of numerous disorders. The type of food, with dry and hastily prepared meals, and the misuse of alcoholic beverages favor the development of gastro-intestinal diseases. Mycoses are frequent, especially actinomycosis, which is observed during the summer months and particularly during the threshing season. Malaria among agricultural workers is at present on the increase.

Professor Ajello called attention to the frequency of diseases of the respiratory apparatus. Pneumonia among the rural population has a high percentage of mortality (placed at 13.5 by recent statistics). Importance attaches to pneumonia induced by cold, which, according to the recent theory of Blum, is characterized by primary disturbances of vasomotor origin, together with edema and congestion, during which the pneumococcus becomes implanted. Ajello found cases of anemia particularly frequent in persons engaged in the raising of cattle. The anemia is often of the hypoplastic type. During the past ten years, considerable improvement has been effected in the hygienic conditions among the rural population.

In recent years, Italy has introduced legislation designed to protect the agricultural population against suffering due to accidents, invalidity and old age.

Professor Castellino discussed conditions among agricultural workers in Italy from the point of view of occupational medicine, mentioning three factors, the housing problem, social and hygienic aid, and the problem of woman's work. A farmer's dwelling frequently consists of old buildings that offer poor protection against the inclemencies of the weather. The conditions affecting women working in the fields have not yet been made the subject of serious study. For centuries, women have borne the brunt of the heavy and insanitary work on small farms, while their compensation has been ridiculously low. This explains why young women seek employment in the cities. If, some day, they return to the old home in the country, they bring, in addition to the vices of the city, a mania for luxury and often tuberculosis and syphilis. An international society, "The League of Rural Women," is seeking today to bring back from the cities young women who have left homes in the country.

PATHOLOGY DUE TO SOLVENTS

For the first time in Italy, the subject of solvents was taken up at a convention of physicians. Professor Carozzi, of the international bureau of labor in Geneva, brought out that the world consumes each year about 100,000 tons of solvents, those most frequently used being acetone; the ethyl, the amyl and the butyl acetates; the glycol esters. Carozzi surveyed the physical and chemical properties of about 100 solvents and diluents.

Professor Nebuloni of Milan dealt with the clinical aspects of intoxications due to volatile organic solvents, which, as a rule, arise from inhalation of vapors. Lesions resulting to the nervous system are frequent, such neurotropism being due to the great affinity that solvents manifest for fats and organic fluids. Another characteristic is the narcotic action. Lesions of the liver and of the kidneys may be produced.

Professor Loriga of Rome spoke on the subject of prophylactic measures, which concern particularly protection of the respiratory apparatus and of the skin. In applying varnishes in the form of a spray, it is necessary to use a booth and a mask in addition; also special working garments, a cap and gloves. After finishing work, one should remove carefully all varnish stains and, when possible, take a full bath. A workman should not carry on spraying for more than four hours on one day, and on not more than three or four days each week. Women and children should not be permitted to do such work.

For the next congress, to be held in 1934, Professor Devoto, the chairman, proposed the following topics: (1) Fishing and Maritime Labor, (2) Changes in the Nervous System Resulting from Occupational Intoxications, and (3) the Statistical Recording of Phenomena Brought Out by Industrial and Occupational Medicine.

JAPAN

(From Our Regular Correspondent)

Nov. 1, 1932.

Tuberculosis Problems

The first council of the antituberculosis association, held October 18 at the Japanese Medical Association Hall in Tokyo, was attended by about 130 members representing every local branch. The home minister's problem submitted for deliberation was "how to protect patients when they have recovered," while "What is the most appropriate manner of preventing tuberculosis at school?" was submitted to the conference by the minister of education. The two reports will be made by the end of next March. Propositions were brought forward to encourage the government in prevention work or to assist associations such as the White Cross. The proposition to establish government sanatoriums was a subject of warm dispute, because at present this disease is prevalent both in villages and in towns. That the primary school teachers should be examined at least twice a year by law was another proposition to be presented to the government.

Epidemic Encephalitis

Since the beginning of the year, more than 100 cases of epidemic encephalitis have been discovered in Okayama Prefecture, and several cases have been reported from six other prefectures. Professor Kakinuma of the Okayama Medical College and Dr. Matsuhara of the Kurashiki Central Hospital organized a group to visit the devastated districts. As a result, they declare that they have found a new form of bacillus which they regard as the cause of this disease. At the same time in Fukuoka a research party from the Fukuoka Imperial University examined the infected districts. They too deem that they have found the cause. Keen interest is being shown in the dispute about the cause of the epidemic.

Lay Proprietors of Hospitals

The physician in this country is now oppressed by factors which are believed to have been caused in part by the world-wide depression and in part by the change in society. One reason for the present awkward position is the sudden increase in government hospitals and other institutions under communal management. In every prefecture there is a prefectural hospital, and sometimes a village clinic. In towns, the Red Cross hospitals or other public hospitals are increasing in number and they can afford to provide equipment superior to that of private hospitals. The army and the navy have their clinics. The police and the railway company are to establish their medical institutes, while industrial factories have in their buildings well equipped hospitals. On the other hand, the number of practitioners increases every year and they are compelled to compete among themselves to their disadvantage. Recently, hospitals have sprung up whose proprietors are nonprofessional and who run them merely to make money. This kind of hospital, with the sign "cost clinic," is now in fashion, and it is reported to be well patronized because patients are attracted

by the so-called small fee, which is in reality far from small. There are two opinions: One is to develop the government or public hospitals and thus to employ as many practitioners as possible. The other is conservative in that it defends the vested rights of physicians and tries to reject others. In the so-called cost clinic the medical men are only employees and the employer is nonprofessional. There arose a doubt about the employer's qualification to buy powerful medicines or poisons. This is a difficult medicolegal problem. The practitioners are trying in every way to check the growth of such hospitals. But the government is said to be so bold as to be planning to revise the law, if the coming session of the diet approves. Anyhow, the result seems to be unfavorable to the practitioners.

Medical College News

The Seoul Medical University, in Korea, celebrated its ninth anniversary, October 15.

The Nagasaki Medical University is eager to send its graduates to the newly established republic of Manchukuo. Prof. Dr. Aoki has been appointed director of the government hospital in Manchuria. He is the first physician to be offered such an important position there.

The Chiba Medical University hospital was the first to adopt the system of free consultation, which is uncommon in this country. But the patients are required to get their medicine at this hospital when they are examined.

The South Manchurian Medical College hospital has raised its budget, amounting to more than 700,000 yen, which, added to the subsidy from the railway company, makes its maintenance simple. In the last six months it had more than 18,000 patients.

The Hokkaido Medical College organized three aid camps and dispatched fifteen physicians and others to aid sufferers from the recent flood, the most disastrous in the last twenty years.

Blood Types of Japanese Athletes

Dr. A. Ogawa has investigated the blood types of Japanese student athletes, including 102 baseball players, 92 track athletes and 61 swimmers. All of them are first-class athletes of the big universities in Tokyo, including several who won fame at Los Angeles this summer. It may be concluded that there are no particular features in the distribution of the blood types among athletes.

VIENNA

(From Our Regular Correspondent)

Oct. 12, 1932.

Congress on Disorders of Metabolism

The Gesellschaft für Verdauungs- und Stoffwechselkrankheiten held its eleventh session in Vienna, October 7-9, which was attended by a large number of physicians from Austria, Germany, Switzerland, Hungary, Czechoslovakia and other countries. In the inaugural address, Professor Falta of Vienna reviewed the history of the society, which was founded in 1914 and now numbers nearly 600 members. It was planned that the session this year should be held in collaboration with the Deutsche Pharmakologische Gesellschaft and that the problem of "Resorption in the Digestive Tract" was to have been discussed by the two societies. But the meeting of the pharmacologic society had to be postponed, so the other society was obliged to shoulder the full responsibility for the discussion of this important question. Fortunately, the essayists originally appointed expressed a willingness to collaborate in accordance with the original plan.

The session dealt with three main topics: (1) Enteral and Parenteral Resorption; (2) Insulin in Relation to Diabetes Mellitus, and (3) Diseases of the Rectum and the Sigmoid. For the first time the plan of appointing discussants in advance to open the general discussion on the papers was carried out. In addition to the three main topics, addresses were delivered by Dozent Dr. Urbach of Vienna on the "Treatment of Skin Diseases of Alimentary Origin" and by Fiebiger of Vienna on "Parasites of the Intestine."

ENTERAL AND PARENTERAL RESORPTION

The first paper on enteral and parenteral resorption was presented by Professor Mansfeld. He first discussed resorption by the skin, showing why the skin is impervious to water, and stating, contrary to the ordinary view, that it is because of the horny layer, that it is due to electrochemical processes in the deeper layers of the skin. It is important that fat-soluble substances (also medicaments) are absorbed by the skin. Also many dangerous poisonous gases penetrate the skin, sometimes more easily than they penetrate the lung. This is important in the problem of protection against war gases. He called attention to the importance of lung resorption, especially in connection with the use of certain medicines. Anesthesia is based on this fact. He showed that insulin is readily taken up by the lungs. It must, however, be properly broken up into spray, in which form it may be inhaled. Also nicotine is quickly resorbed. The resorption from the digestive tract was considered. He showed that sugars are resorbed selectively, the sugars that are suitable for food being resorbed more readily than those that are unsuitable. The gastric secretion is capable of checking early resorption by the stomach and thus assure the more complete digestion of foods.

The paper of Nonnenbruch of Prague dealt with the clinical aspects of the resorption process. He explained the problems bearing on the inflammatory processes and the resulting disturbances of resorption. By numerous illustrations he supported the view that stimulation of the intestine effects an increase of fat resorption and that the activity of the intestinal vilii probably constitutes an important biologic factor in resorption, although that is not a necessary precondition. The older view that the internal secretion of the pancreas is closely connected with fat resorption can no longer be upheld. It appears likely, however, that the spleen plays herein a more important part than was supposed.

The surgical side of the question, which was to have been considered by Clairmont, who was taken ill, was handled by Denk of Vienna, who showed how resorption by the subcutaneous connective tissue takes place; how it is brought about by the peritoneum; how the resorption of intestinal toxins from constricted portions of the intestine occurs; how hematomas and exudates are resorbed, and how different parts of the intestine act differently in such processes.

The animated discussion that followed the presentation of these problems was participated in by Bürger, Bonn; Hoff, Vienna; Paffrath, Düsseldorf, and Zweig of Vienna, who took up the reception and elimination of radon, and emphasized the danger of radium salts. Radon, however, is almost completely eliminated with the expiratory air within forty-five hours after the administration. The resorption by the stomach is very slight. Hoff spoke on the resorption of exudates in the central nervous system and explained the so-called hemato-encephalic barrier. Keller of Prague reported the results of his studies on the part played by electrical influences in resorption.

INSULIN

The first speaker on insulin, the second main topic, was Staub of Basel, who called attention to the contrast between the pancreatic hormone and the hormone of the suprarenal glands and discussed the effects of insulin on the nervous system. He advanced a new theory in explanation of diabetes. He regards insulin as a hormone that acts on the parasympathicus and produces a reduction in the tonus of that system. Herxheimer presented facts connected with the history of diabetes. In 1845 it was first recognized that changes in the pancreas occur in diabetes. In 1889 Minkowski and Mering demonstrated that

the removal of the pancreas produces diabetes. That same year the term "internal secretion" was introduced. A short time later it was shown that the pancreas consists of two parts; one part furnishes the ferments for the intestine, while the other portion, the islands of Langerhans, regulates sugar metabolism. Herxheimer pointed out that reduction or atrophy in the number of "cell islands," their induration and hyaline degeneration, are characteristic of diabetes. The cell islands resemble closely in structure the remaining tissues of the pancreas, and it is believed that their new formation from the other part of the gland is possible, as has been shown by the experimental ligation of the pancreatic duct in animals ("Mansfeld's effect"). The blood sugar drops then to one eighth of its normal value. This rather difficult operation has been successfully carried out on man (young diabetic patients). No detailed reports, however, have been furnished as yet. Herxheimer brought out that diabetes does not always produce changes in the pancreas and that, on the other hand, certain liver diseases (cirrhosis) may cause an existing diabetes to disappear.

Professor Falta of Vienna then spoke on the place of insulin in diabetes research. One always finds primary indurative and degenerative processes in the pancreas of the diabetic patient. The changes in the suprarenals and in the hypophysis are to be regarded as secondary. In resistant types one finds less acetone and less frequently loss of weight, and Falta thinks that resistance to insulin is often due to a strong counteraction of the suprarenals. It is likely that in high-grade resistance to insulin this strong activity of the suprarenals in itself produces the diabetes. The following view prevails: The disturbances of sugar metabolism may be divided into two groups: (1) Either the islands of Langerhans function too strongly on account of tumor-like proliferation, in which case hyperinsulinism exists, or (2) the suprarenals act too weakly. In both cases there develop the hypoglycemic symptom complex and its usual sequels. If the equilibrium between the functions of the islands of Langerhans and the suprarenals is disturbed (usually to the advantage of the latter) there occurs a degeneration of the islands or a hyperfunctioning of the suprarenals. In both cases there arises an increase of the blood sugar content and an increased elimination of sugar in the urine. The administration of insulin regulates quickly the sugar metabolism. During the general discussion, much time was devoted to the diet in diabetes. The controversy turned about the question as to whether diabetic patients should be given food poor or rich in fat. The Vienna "school," with Porges-Adlerberg and Professor Noorden at the head, recommends a diet that is poor in fat but rich in proteins and carbohydrates, whereas many other investigators still hold to the older method of a diet poor in carbohydrates. Professor Lublin of Greifswald discussed the experiences gained in applying a fat-poor diet, rich in fruit and proteins, to 400 diabetic patients on the Island of Rügen. In connection with this treatment, work therapy was found to give favorable results. The patients could be given up to 250 Gm. of bread daily, and the blood sugar fell on working days but went up again on Sundays. Rosenberg has reported similar observations from the Krankenhaus Westend in Berlin. In spite of work and a diet rich in carbohydrates, the patients felt well. In the Wenckebach clinic of Vienna, under the direction of Porges, fat is restricted in diabetes therapy, 50 Gm., at the most, being allowed each day. It was found that the ingestion of only two food substances—for example, proteins and carbohydrates—acts more favorably than the ingestion of three food substances, and that the work performance is thereby increased. Professor v. Noorden recommends ample use of fruits, about 600 Gm. each day. He thinks that the resistance to insulin is overcome by a diet extremely low in fat but that it is not advisable to hold a diabetic patient to an absolutely strict form of diet. Stepp of Breslau spoke on the offspring of diabetic women, Burger of Berlin on the purity of insulin, Strauss of Berlin on parathyroid extract, which resembles insulin in its action; Schmidt of Prague on denervation of the suprarenals as diabetes therapy, Pulay of Vienna on skin symptoms in diabetes, such as sweating and itching, in which connection he called attention to the anterior lobe of the hypophysis.

DISORDERS OF THE LOWER INTESTINE

The third chief topic, "Disorders of the Lower Intestine," was introduced by Professor Maresch, who reported on the newer views promulgated in Vienna on the development of the intestine, and on the research of Politzer concerning the origin of fistulas in the rectal region. He discussed the relation of polyps of the large intestine to carcinoma. German surgeons maintain that 50 per cent of such polyps degenerate into carcinoma, for which reason they demand their operative removal. Maresch, however, has shown that only from 3 to 7 per cent of these polyps become malignant. Fischer of Frankfort-on-Main discussed diverticula and the effectiveness of roentgen technic in ascertaining whether strictures are present, and if so, whether they are of an organic or spastic nature.

A. W. Meyer of Berlin, who gave an excellent survey of rectal surgery, brought out that carcinoma of the rectum occurs even in children aged 11 to 13, and that neither the clinician nor the pathologist can expect to give a reliable statement as to the malignancy of a tumor merely from a microscopic study. Every rectal tumor must be treated as a separate individual case. G. Wagner spoke on the relations between the rectum and the genital tract. He called attention to the injuries that adjacent organs may suffer from too intensive radium treatment and recommended for such injuries high voltage roentgen irradiation (600 kilovolts) as harmless.

Arzt of Vienna spoke on syphilis and gonorrhea of the rectum and exhibited pictures and wax models of skin lesions. Various instruments for examination were exhibited. Schindler demonstrated his flexible gastroscope, and Kalk exhibited pictures of living abdominal organs.

Boas of Berlin spoke on the treatment of inflammations of the large intestine and on diet without salt or spices, in pruritus. The subaqueous intestinal bath, in the opinion of R. van den Velden, has proved effective in stasis and chronic intestinal catarrh.

Following the papers and discussion, addresses were delivered by Dozent Dr. Urbach, who reported his research on alimentary allergy. Professor Fiebiger of the Vienna Veterinär-Hochschule discussed intestinal parasites in man and animals, calling attention to the knowledge acquired in recent years. An exhibit of dietetic and other medicaments was held in connection with the congress.

Marriages

JOEL A. PETERSON, Urbana, Ill., to Miss Genevieve Nelson of Red Wing, Minn., in Decatur, Ill., October 15.

REX K. POMEROY, Wenatchee, Wash., to Miss Zelma Nash of Walkerton, Ind., in South Bend, November 1.

WILLIAM SPENCER LAWLER to Miss Elena M. Mahoney, both of Lowell, Mass., October 15.

FRANK BROCK ORR to Miss Nancy Gardiner Willard, both of New York, November 29.

WILLIAM WESTON, JR., to Miss Henrietta Nelson, both of Columbia, S. C., October 22.

SAMUEL CLIMO, Cleveland, to Miss Esther Levitan of New Haven, Conn., August 28.

ERNEST G. KIECK, Cedar Rapids, Iowa, to Miss J. Ann Dickson, November 24.

ELMER E. ZOLMAN, Long Beach, Calif., to Mrs. Minnie Walker, September 20.

JAMES C. ZAN, Portland, Ore., to Mrs. Louise Poulsen Papst, October 1.

EARL RUNYAN TYLER to Miss Beryl Jones, both of Durham, N. C., recently.

Deaths

William Sydney Thayer ⊕ President of the American Medical Association, 1928-1929, died of heart disease, December 10, while visiting in Washington, D. C. Dr. Thayer was born in Milton, Mass., June 23, 1864, the son of James Bradley and Sophia Bradford (Ripley) Thayer. His education included Milton Academy in Cambridge, Mass., the Cambridge High School, the degree of A.B. from Harvard in 1885 and the M.D. degree in 1889. After an internship in the Massachusetts General Hospital he studied in Berlin and Vienna and then became district physician in the Boston Dispensary. In 1890 he became assistant resident physician in the Johns Hopkins Hospital and was resident physician from 1891 to 1898. He also studied in Paris in 1893. Dr. Thayer served as attending physician and head of the medical department in the dispensary during the years 1898 to 1906, at the same time serving as associate professor of medicine and later as professor of clinical medicine in the medical school. Here he was intimately associated with Osler. From 1918 to 1921 he was professor of medicine in Johns Hopkins University Medical School and in 1921 he became emeritus professor. He served also as consulting physician of the Church Home and Infirmary and as visiting physician of the Hospital for Women of Maryland.

WILLIAM SYDNEY THAYER, M.D., 1864-1932

During the World War Dr. Thayer was a major in the medical section of the Officers Reserve Corps. He was assigned to active duty in 1918 and served subsequently as director of general medicine in the American Expeditionary Forces and then as chief consultant in medicine, on retirement receiving the rank of brigadier general. He also went with Dr. Frank Billings on the commission to Russia, receiving the distinguished badge of the Red Cross of Russia in 1918. The distinguished service medal of the United States government was conferred on him in 1919 and he was awarded the rank of officer in the Legion of Honor in France in 1923.

Early in his career Dr. Thayer became distinguished for ability in organization and research. His contributions to the etiology of malaria received wide recognition, and it was generally recognized that the training which Lazear had with Thayer was instrumental in the success achieved by the Yellow Fever Commission. The contributions of Thayer to scientific research included also studies of the blood in various pathologic conditions, especially in typhoid, the cardiac diseases, chorea, arteriosclerosis, heart murmurs and heart block. His accomplishments were recognized by election to honorary membership in numerous domestic and foreign medical societies. He was president of the Association of American Physicians, the Interurban Clinical Club, the American Society of Tropical Medicine and the American Society for Clinical Investigation, and a member of the American Academy of Arts and Sciences, the American Philosophical Society, the American Association for the Advancement of Science and the Medical Historical Society. He was also an honorary member of the Therapeutic Society of Moscow, the Royal Society of Medicine of London, the Association of Physicians of Great Britain, the Royal Medical Society of Budapest, the Académie de médicine of Paris and the International Tuberculosis Association, and a corresponding member of the Gesellschaft für innere Medizin of Berlin and of Kinderheilkunde in Wien.

The contributions of Dr. Thayer are numerous both to medical and to lay literature. He was the author of "The Malarial Fevers of Baltimore," published in 1895; "Lectures on Malarial Fevers," 1897; "Studies on Bacterial Endocarditis," 1925; "America," 1917; "Other Verse," 1926, and recently a volume of collected addresses and sketches.

In the American Medical Association Dr. Thayer served as chairman of the Section on Practice of Medicine, 1902-1903. He was a member of the editorial board of the *Archives of Internal Medicine* from the time this publication first began in 1908 until 1932. He was made a member of the Judicial Council in 1918 and served on that body until his election as President-Elect in 1927.

Great Britain honored him by asking him to give the Bright Lecture in clinical medicine in 1927. Dr. Thayer was also for many years a member of the Board of Overseers of Harvard University. He also received the LL.D. degree from Washington College in 1907, from McGill University in 1929 and from Edinburgh University in 1927. He was appointed by Secretary of the Interior Ray Lyman Wilbur to serve as a member of the Education Commission to study the relationship of the national government to education. In 1928 he received the degree of Doctor Honoris Causa from the University of Paris and during the same year was appointed Gibson Lecturer at the Royal College of Physicians of Edinburgh. The University of Chicago in 1927 conferred on him the honorary D.Sc. The friends of Dr. and Mrs. Thayer established the Thayer Lectureship in his honor at Johns Hopkins University in 1928, the first course of lectures being given by Sir Humphry Rolleston.

The career of Dr. Thayer in the field of medicine represents the highest type of achievement in many fields. His character was sympathetic, his friendships were warm, his ideals of the highest. His appreciation of literary classics stimulated him to accomplishments of a high order in the fields of the essay and of verse. He was a great teacher and clinician of ability, and he left in the minds and in the hearts of many young men an appreciation of the significance of medical service.

John Llewellin Eliot, Minneapolis; Georgetown University School of Medicine, Washington, D. C., 1874; member of the Medical Society of the District of Columbia; formerly professor of clinical medicine at his alma mater; at one time medical inspector, health department of the District of Columbia; formerly on the staffs of the Providence Hospital and the Smallpox Hospital, Washington, D. C.; aged 79; died, November 14, of hypostatic pneumonia.

George H. Noble ⊕ Atlanta, Ga.; Atlanta Medical College, 1881; member of the American Gynecological Association and the Southern Surgical Association; fellow of the American College of Surgeons; emeritus professor of clinical gynecology, Emory University School of Medicine; consulting gynecologist to the Grady Memorial Hospital and for many years proprietor of an infirmary bearing his name; aged 72; died, October 29, in the Emory University Hospital.

William L. Hearst ⊕ Cedar Falls, Iowa; State University of Iowa College of Medicine, Iowa City, 1897; fellow of the American College of Surgeons; past president of the Black Hawk County Medical Society; served during the World War; on the staff of the Sartori Memorial Hospital; aged 67; died, October 28, of coronary thrombosis.

James William MacFarlane ⊕ Pittsburgh; University of Pennsylvania School of Medicine, Philadelphia, 1878; fellow of the American College of Surgeons; aged 78; consulting surgeon and president, medical department, Western Pennsylvania Hospital, where he died, November 21, of mastoiditis and pneumonia.

Alvin Richard Eaton, Jr. ✠ Elizabeth, N. J.; Cornell University Medical College, New York, 1902; member of the Associated Anesthetists of the United States and Canada; fellow of the American College of Surgeons; formerly county coroner; attending surgeon to the Elizabeth General Hospital; aged 53; died, November 17, of cerebral hemorrhage.

Carlos Domer Lane, Ligonier, Ind.; Medical College of Indiana, Indianapolis, 1905; member of the Indiana State Medical Association; health officer of Ligonier; formerly county coroner and secretary of the board of health of Ligonier; aged 49; died, November 15, in St. Joseph's Hospital, Fort Wayne, of embolism, following a hemorrhoidectomy.

Emanuel David Newman ✠ Newark, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1885; on the staffs of the Irvington (N. J.) General Hospital, Essex County Hospital, Cedar Grove and the Essex Mountain Sanatorium, Verona; aged 69; died, November 4, of tumor of the lung.

Milton Guy Owen ✠ Springfield, Ill.; Hahnemann Medical College and Hospital, Chicago, 1894; past president of the Sangamon County Medical Society; formerly member and president of the board of education; aged 60; on the staff of St. John's Hospital, where he died, November 12, of sepsis.

Yandell Young Miller, Dukedom, Tenn.; University of Louisville (Ky.) School of Medicine, 1898; member of the Kentucky State Medical Association; served during the World War; aged 58; died, November 16, in the Mayfield (Ky.) Hospital, of cholecystitis.

Herbert Francis Gammons ✠ Amherst, Ohio; Boston University School of Medicine, 1909; member of the Medical Society of the State of New York; medical superintendent of the Pleasant View Sanatorium; aged 44; died, November 21, of diabetes mellitus.

Andrew Fowler Grant ✠ Tanta, Egypt; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1899; member of the Iowa State Medical Society; superintendent of the American Mission Hospital; aged 62; died, July 4, of heart disease.

Cuthbert Gilham, Washington, D. C.; University of Virginia Department of Medicine, Charlottesville, 1887; veteran of the Spanish-American War; aged 67; died, November 8, in the United States Naval Hospital, of cerebral hemorrhage and arteriosclerosis.

Wilhelm Heinrich Brauns ✠ Buffalo; University of Buffalo School of Medicine, 1901; member of the Associated Anesthetists of the United States and Canada; aged 62; died, November 6, of septic thrombophlebitis of the leg, following a minor injury.

Herbert G. Wertheimer ✠ Pittsburgh; University of Pennsylvania School of Medicine, Philadelphia, 1901; for many years on the staffs of the Allegheny General and St. Francis hospitals; aged 53; died, October 25, of cerebral thrombosis.

George Edwin Lewis, Chester, W. Va.; Western Pennsylvania Medical College, Pittsburgh, 1897; formerly on the staff of the East Liverpool City Hospital, East Liverpool, Ohio; aged 59; died, November 5, of uremia and arteriosclerosis.

Martin Joseph Morrissy, Newberry, Mich.; Marquette University School of Medicine, Milwaukee, 1929; member of the Michigan State Medical Society; on the staff of the Newberry State Hospital; aged 28; died suddenly, October 30.

Thomas J. Mizer ✠ Cleveland; University of Wooster Medical Department, Cleveland, 1896; aged 60; on the staff of St. John's Hospital, where he died, November 14, of injuries received when he was struck by an automobile.

Edward Ray Schunk ✠ Sheridan, Wyo.; Chicago College of Medicine and Surgery, 1910; served during the World War; on the staff of the Sheridan County Memorial Hospital; aged 48; died suddenly, October 25, of angina pectoris.

J. Milton O'Neal, Zanesville, Ohio; Starling Medical College, Columbus, 1892; member of the Ohio State Medical Association; formerly county health officer; aged 67; died, November 11, in the Good Samaritan Hospital.

St. Clair Darden ✠ South Bend, Ind.; Medical College of Virginia, Richmond, 1912; medical superintendent of the Healthwin Hospital; aged 40; died, November 15, of burns received when his lodge caught fire.

Marion Warren, Science Hill, Ky.; Hospital College of Medicine, Louisville, 1906; member of the Kentucky State Medical Association; aged 57; died, November 9, of injuries received in an automobile accident.

Isaac Arnold McSwain, Paris, Tenn.; Vanderbilt University School of Medicine, Nashville, 1889; past president of the Tennessee State Medical Association; aged 86; died, October 30, of chronic myocarditis.

William Wilson Reynolds, Proctorville, Ohio; Rush Medical College, Chicago, 1883; Jefferson Medical College of Philadelphia, 1891; aged 77; died, October 24, at Huntington, W. Va., of heart disease.

Israel Harmon Stevens, Cuyahoga Falls, Ohio; Starling Medical College, Columbus, 1891; member of the Ohio State Medical Association; aged 64; died, October 23, of coronary occlusion and influenza.

William Adolphus Gantt, Jefferson, S. C.; University of Georgia Medical Department, Augusta, 1910; aged 46; died, November 4, of bronchial asthma, acute nephritis and acute dilatation of the heart.

Emma Thornton Miller, San Antonio, Texas; Woman's Medical College, Chicago, 1890; member of the State Medical Association of Texas; formerly a medical missionary; aged 68; died, August 7.

Charles Wilbut Foster, Portland, Maine; Detroit Medical College, 1875; member of the Maine Medical Association; for many years member of the school board; aged 82; died, November 6.

Charles Wilson Averell, Akron, Ohio; Tufts College Medical School, Boston, 1903; member of the Ohio State Medical Association; aged 67; died, November 22, of chronic nephritis.

William Byers Case, Heber Springs, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1894; aged 61; died, October 18, of arteriosclerosis and chronic interstitial nephritis.

Samuel Riegelhaupt ✠ Cleveland; Medizinische Fakultät der Universität Wien, 1886; aged 69; died, August 24, in the Cleveland Clinic Hospital, of cerebral hemorrhage and arteriosclerosis.

William J. Stilson, Lawrence, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1904; aged 62; died, September 13, at Topeka, of hypertensive heart disease.

Henry C. Spring, Bristol, Conn.; University of the City of New York Medical Department, 1897; aged 58; died, October 18, of chronic nephritis, endocarditis and cirrhosis of the liver.

Henry Consider Allen, Circleville, Ohio; Bellevue Hospital Medical College, New York, 1878; aged 80; died, November 20, in the Johns Hopkins Hospital, Baltimore, of pneumonia.

Albert W. Dumm, Columbus, Ohio; Columbus Medical College, 1876; veteran of the Spanish-American War; aged 84; died, November 12, in the University Hospital, of uremia.

Carroll Burnell Danner, Spring Grove, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1932; aged 22; died, November 11, in a hospital at York, of chronic nephritis.

John Seeley, Woodhull, N. Y.; University of Pennsylvania School of Medicine, Philadelphia, 1900; formerly state senator; aged 59; died, October 30, of organic heart disease.

Cullie J. Green, Durant, Okla.; Louisville (Ky.) Medical College, 1890; member of the Oklahoma State Medical Association; aged 71; died, October 28, of chronic myocarditis.

Margaret Harrison Polk, Augusta, Ga.; Woman's Medical College of Pennsylvania, Philadelphia, 1893; formerly a medical missionary; aged 72; died, October 22, of sprue.

Pietro Ferri, Brooklyn; Royal University of Bologna Faculty of Medicine and Surgery, Bologna, Italy, 1877; aged 79; died, November 16, of carcinoma of the gallbladder.

John Bryden Kent, Larchmont, N. Y.; Harvard University Medical School, Boston, 1869; member of the Connecticut State Medical Society; aged 86; died, October 12.

George Peter French, Rochester, N. Y.; College of Physicians and Surgeons, Medical Department of Columbia College, 1889; aged 67; died, November 25, of pneumonia.

Fletcher Tivis Riley, Milwaukee; Medical College of Ohio, Cincinnati, 1877; aged 77; died, November 6, at his home in Wauwatosa, of cerebral hemorrhage.

John Hayes, Richmond, Que., Canada; McGill University Faculty of Medicine, Montreal, 1890; formerly councilor and mayor of Richmond; aged 66; died, August 19.

Louise J. Wotring Lyle, Buffalo, Pa.; Presbyterian Hospital and Woman's Medical College, Cincinnati, 1892; aged 90; died, October 16, of cerebral hemorrhage.

William Henry Willson, Fond du Lac, Wis.; Hahnemann Medical College and Hospital, Chicago, 1875; served during the World War; aged 78; died, October 18.

Henry George Bentz ⊕ Buffalo; University of Buffalo School of Medicine, 1888; aged 67; died, November 12, of cerebral hemorrhage and chronic arthritis.

James Adams McGrew ⊕ New Athens, Ohio; College of Physicians and Surgeons, Baltimore, 1886; aged 69; died, November 15, of cerebral hemorrhage.

Theodore P. Painter ⊕ United, Pa.; Jefferson Medical College of Philadelphia, 1887; aged 72; died, October 10, of injuries received in an explosion.

Charles Frederick Little ⊕ Manhattan, Kan.; Rush Medical College, Chicago, 1863; Civil War veteran; aged 96; died, November 17, of myocarditis.

Richard Lee Linthicum, Church Creek, Md.; Jefferson Medical College of Philadelphia, 1887; aged 68; died suddenly, October 18, of heart disease.

Virgil R. Butt, Bakersville, N. C.; Jefferson Medical College of Philadelphia, 1886; aged 76; died, November 5, of carcinoma of the prostate.

Robert Henderson, Urbana, Ohio; Columbus Medical College, 1880; formerly mayor; aged 81; died, November 16, of cerebral hemorrhage.

Louis Theodore Klinker, Westwood, N. J.; College of Physicians and Surgeons in the City of New York, 1893; aged 62; died, October 2.

John Paul Nemours ⊕ St. Louis; St. Louis College of Physicians and Surgeons, 1889; aged 71; died, November 15, of chronic myocarditis.

Clara Elizabeth Atkinson, Fairhope, Ala.; State University of Iowa College of Medicine, Iowa City, 1876; aged 87; died, October 16.

James Hittner, Seymour, Wis.; College of Physicians and Surgeons, Keokuk, Iowa, 1890; aged 66; died, November 14, of heart disease.

Henry Edward Miller, Alton, Iowa; St. Louis College of Physicians and Surgeons, 1895; aged 81; died, November 6, of arteriosclerosis.

Jonathan Davis Moore, Marlin, Texas; Missouri Medical College, St. Louis, 1880; aged 82; died, November 5, of diabetes mellitus.

Daniel R. Stratton ⊕ Lancaster, N. Y.; Medical Department of the University of the City of New York, 1895; died, September 4.

Charles R. Tinder ⊕ Girard, Kan.; Marion-Sims College of Medicine, St. Louis, 1891; aged 67; died, November 8, of myocarditis.

Patrick Joseph Stricker, Bordelonville, La.; Memphis (Tenn.) Hospital Medical College, 1889; aged 83; died, September 20.

Frank L. Roebuck, Ashland, Ohio; Starling Medical College, Columbus, 1892; aged 64; died, September 14, of arteriosclerosis.

Franklin Gray Ketchum, Cambridge, N. Y.; Baltimore Medical College, 1897; aged 58; died, November 16, of diabetes mellitus.

William White Collins, Genou, Mont.; Rush Medical College, Chicago, 1904; aged 63; died suddenly, October 29.

Edward F. Randall, St. Louis; American Medical College, St. Louis, 1891; aged 63; died, November 2, of heart disease.

Alden M. Oliver, Voorheesville, N. Y.; Albany Medical College, 1874; aged 81; died, September 7, of arteriosclerosis.

Susan J. Fenton, San Leandro, Calif.; Hahnemann Medical College, San Francisco, 1889; aged 83; died, October 26.

Percy Gordon Brown, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1908; aged 48; died, August 26.

W. Pliny League, Simpsonville, S. C.; Atlanta Medical College, 1867; Civil War veteran; aged 88; died, October 14.

Hibbert Rice Roberts ⊕ Rochester, N. Y.; University of Buffalo School of Medicine, 1903; aged 53; died, September 7.

James A. U. Carter, Sapulpa, Okla.; Meharry Medical College, Nashville, Tenn., 1910; aged 53; died, August 20.

John B. Clark, Eastman, Ga.; College of Physicians and Surgeons, Baltimore, 1893; aged 63; died, September 7.

J. L. McGowan, Knoxville, Tenn.; National Medical University, Chicago, 1907; aged 66; died, August 22.

Charles Meigs Dulaney, Blountville, Tenn.; Tennessee Medical College, Knoxville, 1901; died, October 3.

Correspondence

HEATED OR RAW MILK AND THE TEETH

To the Editor:—I was much interested in the editorial in THE JOURNAL, October 29, on the growth promoting properties of heated and of raw milk. I find in this editorial, and rather generally in articles dealing with nutrition researches carried on by medical men, a failure to utilize readily accessible clinical information very directly related to nutritional problems. I have reference to the condition of the teeth.

You are, of course, familiar with the fact that many physicians and dentists are convinced that dental disease may be largely controlled by dietary means through the medium of the effect of diet on the nutrition of the body. It is a common observation of dentists that children living on diets which contain all the presumably important vitamins and necessary mineral elements still are subject to caries and gingival disorders. It is assumed that the reason for this is that the necessary vitamins or other nutritional requisites are not present in optimal amounts, although they may be present in such amounts as to protect the child from such diseases as rickets and also to promote growth adequately.

It is therefore coming to be believed that the teeth are perhaps the most sensitive body tissue, as regards the effect on them of slight dietary deficiencies. I might state this by saying that the teeth through the incidence of caries are the first tissue to indicate dietary deficiencies involving chiefly vitamins A, D and C.

You will therefore understand my disappointment, on reading the editorial, to find no reference as to whether the teeth of the children fed on raw milk show any difference in susceptibility or immunity from those of the children fed on heated milk.

I bring this to your attention in the hope that it may through your intervention stimulate medical men engaged in similar researches to seek the association of reliable dental observers as a means of presenting a more fully rounded conclusion to their studies along nutritional lines.

JOHN OPPIE MCCALL, D.D.S., New York.
Director, Guggenheim Dental Clinic.

"RADIUM IN THE UNITED STATES"

To the Editor:—I read with considerable interest and some apprehension in the November 5 issue of THE JOURNAL, page 1609, the editorial comment entitled "Radium in the United States." The comment closed with the statement that "certainly there is a tremendous need for more and less expensive radium, especially for the treatment of cancer." I agree that there is need for less expensive radium, but the need for more radium is not as great as the writer of that comment would lead one to believe. The important thing is that the radium in the country is so ill distributed. To increase the total quantity of radium available would not by itself improve matters but would tend to make them even worse than they are. Readers of THE JOURNAL are doubtless familiar with the blunders made in England in connection with the distribution and use of radium during the last few years. In comparison with such blunders, the situation in our own country is bad enough as it is, but if the price of radium were to diminish (important as such a reduction would be to those who are qualified to use radium) the situation would then become well-nigh hopeless, because there have been and are no means of controlling the distribution of the product.

The present system whereby, for a consideration, commercial companies rent radium to practically any physician applying for

it appears sound enough in principle but in practice turns out to be one of the worst things with which I am familiar. In a few exceptional cases, this system allows a few men who have taken the trouble to learn something about the use of radium to be able to obtain it without the investment of a considerable sum of money; but, in the vast majority of instances, physicians who obtain radium from commercial companies know little or nothing about its use, and the results of such indiscriminate therapeutic use of radium are often appalling.

The American Medical Association could do nothing more wholesome than to work out some scheme whereby this undesirable situation could be effectively corrected and whereby some means of at least indirect control of the distribution of radium may be effected.

A. U. DESJARDINS, M.D., Rochester, Minn.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

MULTIPLE MISCARRIAGES

To the Editor:—A married woman, aged 28, has had four miscarriages in the past two years, all occurring between the sixteenth and the twentieth week of pregnancy. Urine and Wassermann tests are negative. What are the causes other than malposition of the uterus? Assuming it to be malposition of the uterus, please outline the nonoperative treatment. Is suspension of the uterus advisable? Please omit name.

M.D., New York.

ANSWER.—If during the past two years the patient has had four miscarriages, each advanced even only sixteen weeks, she has been pregnant entirely too many times. This means that during the twenty-four months the uterus has contained fetuses for sixteen months. Assuming about five to six weeks for each period of involution, the remainder of the twenty-four months when the patient was not pregnant was consumed by the periods of involution. Hence the patient became pregnant each time as soon as the uterus was capable of receiving a new fertilized ovum. A few months at least should have been permitted to elapse between conceptions.

In general, the causes of spontaneous abortion may be divided into fetal, maternal and paternal. Among the fetal causes are abnormalities in the development of the fetus, diseases of the chorion such as hydatidiform mole, diseases of the placenta such as placenta praevia, defects in the cord, and abnormalities in the amnion such as polyhydramnios. Among the maternal causes of abortion are malformations of the uterus, underdevelopment of this organ, inflammation of the endometrium or the cervix, retroflexion, acute infections, syphilis, trauma, tumors in the uterus or near by, and disturbances in the endocrine glands. The husband may be at fault not only because of a chronic illness or mild poisoning but also because he may not be able to produce spermatozoa that are capable of developing normal, healthy offspring. As yet little is known about this phase of infertility.

It is, of course, essential to make a thorough examination not only of the patient but also of her husband. The examination should include not only a careful investigation of the genital organs but also a search for foci of infection in the teeth, tonsils and elsewhere. The endocrine glands should be studied as much as present knowledge of these glands will permit. A basal metabolism test should surely be made, because hypothyroidism is occasionally the cause not only of sterility but also of habitual abortion. Other illnesses to be considered are nephritis, diabetes and pronounced anemia. The diets of both husband and wife should be reviewed because sometimes deficiencies, especially in certain vitamins, may be responsible for miscarriages. Syphilis usually results in the death and expulsion of fetuses after the fifth month and only rarely before that time. The occupation of the husband should be studied. He may, for example, be exposed to paint or other substances containing lead, and chronic lead poisoning can lead to abortions.

It is unfortunate that the expelled products of conception were not subjected to careful macroscopic and microscopic examination, because occasionally the cause can be detected. In some cases infection in the decidua is found, and in others the fetus is malformed.

Retroflexion is not often the cause of miscarriages, because most women with this condition carry their pregnancies to full term. In nearly all instances in which conception takes place within a retroflexed uterus, the uterus in its growth is drawn out of the pelvis and develops in the same way as an anteflexed uterus. The simplest way to overcome retroflexion whether in a pregnant or in a nonpregnant uterus is to elevate this organ to an anteflexed position and insert a pessary in the vagina. The pessary should be left in place until the pregnant uterus is too large to fall back into the pelvis. This usually occurs when the pregnancy has progressed about thirteen or fourteen weeks. Operation is rarely necessary in cases of uncomplicated retroflexion of the uterus.

PSORIASIS IN CHILDREN

To the Editor:—Is arsenic contraindicated in the treatment of psoriasis in children? What is the latest method of treatment? Please omit name.

M.D., Iowa.

ANSWER.—The use of arsenic by mouth or hypodermically will often clear up an early attack of psoriasis completely without the use of local applications. It is contraindicated, however, in acute psoriasis, rapidly spreading and itching. Solution of potassium arsenite is the form in which it is most often used by mouth, in increasing doses until the maximum is reached, and then continued in a somewhat smaller dose until about a month after the eruption has entirely disappeared. If decided improvement is not seen by the time the maximum dose has been reached, it should be discontinued. In older cases, particularly those in which arsenic has been used in previous attacks, it often fails to be of any benefit.

After a month of freedom from the eruption, the medication should be discontinued, for its continuance between attacks with the idea of preventing recurrence has often caused serious trouble. Prescriptions should always be labeled "Do not repeat." It can be given hypodermically perhaps best as sodium cacodylate. The arsphenamines are said not to be so efficacious.

The most popular, because most successful, of the more recent methods of treatment is that of Goeckerman (*Northwest Med.* **24**:229 [May] 1925), the use of an ointment of crude coal tar with frequent applications of ultraviolet radiation, which activates the coal tar. He uses an ointment made of crude coal tar, from 2 to 6 Gm.; zinc oxide, and petrolatum sufficient to make 120 Gm. This is applied thickly to the lesions and allowed to remain for twenty-four hours. Then most of it is removed with olive oil, a thin film being left. Through this a suberythema dose of ultraviolet radiation is given each day. The patient is then allowed to bathe and remain a few hours without ointment. Then the whole proceeding is repeated. Severe cases clear up in three or four weeks, mild ones more quickly. If the eruption is extensive it is well to examine the urine now and then for signs of absorption. The treatment seems to be without danger and is effective.

Roentgen treatments in small doses, not more than one-fourth erythema dose a week for not more than eight weeks, are also effective but are more dangerous than the foregoing because the patients insist on their repeated use after the maximum safe dose has been given, and psoriasis skin seems highly susceptible to the rays. Telangiectases are liable to appear years after the use of less than erythema doses. Roentgen rays, therefore, are best reserved for emergencies.

TRAUMATIC PNEUMOTHORAX

To the Editor:—A girl, aged 19 years, had a fracture of the second rib on the left; one week following the injury a pneumothorax on the left side suddenly developed, displacing the heart well to the right (the apex beat was heard best under the right nipple) with the usual symptoms of cough, dyspnea, cyanosis, rapid pulse and hemoptysis. Air was aspirated on three successive days and again on the fifth day to relieve the circulatory embarrassment. Another roentgenogram was taken then, and the heart had shifted well to the midline; the lung half expanded but the pulse remained fast at the end of two weeks, at which time the patient was allowed to leave the hospital and was advised to go home and remain quiet for about two months. Would you expect any permanent damage or disability from the pneumothorax (traumatic)? If so, what? Please omit name.

M.D., Virginia.

ANSWER.—Traumatic pneumothorax in a patient otherwise healthy, if uncomplicated, clears up spontaneously. The abrasion of the lung, unless of great extent, rapidly heals and the air is promptly reabsorbed from the pleural cavity. At onset and continuing until the air has been absorbed, tachycardia and other evidences of mechanical irritation of the heart are usual. These rapidly disappear following the absorption of the air. In the present instance it is believed that no permanent damage or disability to either the heart or the lung is to be anticipated.

DIAGNOSIS OF SYPHILIS

To the Editor:—A woman, aged 26, has had a chill every other day for five weeks, with an immediate rise of temperature after each chill to 102 or 103 F. On the alternate days her temperature usually is subnormal or normal, though on a few occasions it has been 100 or 99. Examination of the urine is normal; the pulse rate runs from 66 to 84, and the blood pressure has varied from 104 to 88 systolic and from 70 to 62 diastolic. The only positive signs are chronically infected and enlarged tonsils, with some enlarged cervical glands, and a diastolic murmur, heard best at the base on the left of the sternum. The white cells have varied from 6,000 to 8,100, and the neutrophils from 65 to 88 per cent. The blood smear is negative for malarial organisms, and the patient has not responded to adequate doses of quinine. The blood culture is negative, there have been no embolic phenomena, and the spleen is not enlarged. The patient has not been ill since childhood, when she had scarlet fever and typhoid. She has been married twice and has had three children and no miscarriages; but her Wassermann and Kahn tests are both positive. Is it possible that the syphilis, which is of probably three years' standing, is the cause of the chills? Kindly omit name and address.

M.D., Missouri

ANSWER.—The chills and fever exhibited by this patient might well be due to a syphilitic process. In the absence of physical signs of syphilis, one should first be convinced that the serologic diagnosis is correct. Repetition of the Wassermann and Kahn tests, made in the same and in another laboratory, is advisable. While not usually a prominent sign, fever may occur during any phase of a syphilitic infection, from the initial incubation period to the terminal stages of the disease. It may or may not be associated with chills, is usually not very high, and may persist for years. The type of fever may simulate that of other infections, may be intermittent as in malaria, or may be "typhoid" in type, remittent or irregular. The coexistence of syphilis with other infections can lead to diagnostic confusion, especially in the differentiation of syphilis from rheumatic fever, malaria, typhoid, tuberculosis and, in early syphilis, from the acute exanthems.

In late syphilis, the lesions with which fever is more apt to appear are those of the liver, perihepatitis, hepatitis, and breaking down gumma; those of the joints, arthralgia, arthritis, and synovitis; of the cardiovascular system, aortitis, though not frequently; of the central nervous system, acute syphilitic meningitis.

In all febrile syphilitic conditions, uncomplicated by other febrile infections, the fever promptly subsides when antisyphilitic treatment is instituted, a point of great diagnostic importance. If the failure of such treatment indicates that the fever is not due to syphilis, a further search for the cause of the fever must be made. Patients under antisyphilitic treatment may develop a transitory fever with or without a Herxheimer reaction. If syphilis of the liver is the cause of the fever, treatment should advisably be slowly acting drugs, such as mercury or bismuth compounds.

"CLINICAL" AS A WORD

To the Editor:—Will you kindly define the word "clinical" and indicate some of the limitations in the proper use of this term? Inquiry among well informed physicians and reference to various dictionaries have not been especially helpful in arriving at a decision. I noted with interest that one painstaking author, Dr. A. F. Hess, differentiates between clinical evidence and roentgenologic evidence (THE JOURNAL, August 20, p. 649, second column). This observation leads me to ask whether you consider all of the following or only the first as clinical signs of diabetes mellitus: polyuria, hyperglycemia and glycosuria. Is it correct to say that exophthalmos and an increased basal metabolic rate both constitute clinical evidence of disease? We watch for the appearance of xerophthalmia in the albino rat on a vitamin A-free ration. Would you agree that xerophthalmia is clinical evidence of avitaminosis in this case? Please omit name.

Washington, D. C.

ANSWER.—Dr. A. F. Hess is not alone in differentiating between clinical and roentgenologic evidence. Quénu and Jacquelin (abstr. THE JOURNAL, September 17, p. 1036) say: "Surgical intervention is indicated clinically by aggravation of pain, frequent vomiting, paroxysmal crises, and decline of the general condition, and roentgenologically by the degree of sinking and dilatation of the duodenum and above all by the severity of the duodenal and retrograde gastric stasis."

An examination of the articles written by Dr. Hess shows that the meaning of the word "clinical" is more clearly apparent from its use than from a definition in a dictionary. Foster's definition is "pertaining to, or founded on, or illustrated by, bedside observation and treatment, or the actual observation and treatment of patients, as distinguished from theoretical considerations and experimental or logical conclusions." The employment of the word by Dr. Hess shows how the word can be used in its original signification and yet hold its own in a changed order of things.

Dr. Hess speaks of his experience with viosterol, "clinical as well as experimental." He mentions the "characteristic clinical, roentgenographic and chemical signs" of rickets. He employs "the usual examinations as well as . . . the newer criteria of rickets, more especially the analysis of the blood for calcium and inorganic phosphorus, and roentgenograms."

Two uses appear in this sentence: ". . . a clinical corollary . . . is that . . . reliance will have to be placed on the development of well established clinical signs and the roentgenologic evidence." By well established clinical signs he means rachitic beads, craniotabes and enlarged epiphyses. A child presenting these signs has clinical rickets. If a roentgenogram becomes necessary to decide, the child has roentgenologic rickets.

Dr. Hess has written so much and expressed himself so clearly that no good reason is apparent for questioning his choice of words.

Mackenzie (*Am. J. Obst. & Gynec.* **24**:233 [Aug.] 1932) discriminates between the clinical and the laboratory points of view, saying that "classifications were made clinically, and the laboratory observations were then examined."

In "Clinical Diagnosis by Laboratory Methods," Todd and Sanford explain that twenty years ago the physician relied on elementary microscopy, blood counts and a few simple tests readily carried out in the office. As the use of laboratory methods in clinical diagnosis has become a necessity, the meaning of the word "clinical" has had to be stretched.

As for the questions by the correspondent, strictly speaking only polyuria is a clinical sign of diabetes mellitus, hyperglycemia and glycosuria being more refined Yet they too might be considered clinical signs for a man who extends his everyday work to include these tests. In the same way exophthalmos might be considered clinical and the basal metabolic rate laboratory; but both would be used in the clinical diagnosis. Dr. Hess would not hesitate to make use of the "clinical corollary."

Work with albino rats is experimental rather than clinical, but the word is so useful that a writer could hardly avoid regarding xerophthalmia as clinical evidence of avitaminosis. The context could be relied on to make the use clear.

The word is too useful to be restricted to bedside observation and treatment; yet writers should take the pains Dr. Hess does to make the meaning clear.

SCARLET FEVER AND OSTEOMYELITIS

To the Editor:—A girl, aged 4, complained of pain in the left hip for two days prior to the onset of a scarlatinal rash, strawberry tongue, and a temperature of 104 F. The fever subsided in a day to 101 and has been fluctuating between 99 and 101 since the onset. A diagnosis of scarlet fever with a complicating arthritis was made. No serum was administered when the child was first examined. After a week the rash began to fade and was followed by desquamation all over the body, including the fingers and toes. Because of the failure of the hip to clear up, a roentgenogram was taken four weeks after the onset and an osteomyelitis of the left greater trochanter was found. Could the rash have been of the septic type, and if so does such a rash desquamate? Does osteomyelitis ever occur as a complication of scarlet fever? Is it likely that the two conditions developed independently of each other? Kindly discuss. Please omit name.

M.D., New York.

ANSWER.—The rash may have been of the septic type. Such rashes may desquamate. Osteomyelitis may be a complication of scarlet fever. It is possible, of course, that acute osteomyelitis and scarlet fever may have developed independently of each other, but the most reasonable explanation would seem to be that it concerned only acute osteomyelitis with toxic staphylococcus erythema. Absence of sore throat and vomiting at the onset would tend to favor this view. If the Dick test should be found positive some weeks after the illness, the indication would be that the child did not have scarlet fever.

EDEMA OF ARM AFTER AMPUTATION OF BREAST

To the Editor:—A woman, aged 71, had a radical breast amputation about four years ago, with all the axillary lymphatics removed, and showed no evidence of metastasis. About two years ago, edema of the arm on the same side began to become evident and has been progressive ever since until it has reached a point at which the tension on the skin at the wrist and dorsal surface of the hand is painful. When the patient is in the prone position with the arm elevated, the edema shifts to the axillary and scapular region, only to return to the dependent portions when the patient rises. What, if any, is the best way to get around this lymphatic blockage and give the patient relief?

HERBERT F. SPIERLING, M.D., Chicago.

ANSWER.—Edema of the arm following radical mastectomy for cancer is due probably to one of two causes: occlusion of the smaller lymphatics about the shoulder by tumor cells, and postoperative infection. Thus, in the absence of recurrence, this postoperative complication develops in 25 per cent of

patients who have been subjected to radical mastectomy. When microscopic examination of the axillary lymph nodes removed at the time of the operation fails to show evidence of cancer, if there is no clinical evidence of recurrence in the skin, axilla and supraclavicular regions, the cause of the edema is more likely to be postoperative infection than recurrent carcinoma, although the latter remains a possibility.

When there is palpable evidence of disease in the supraclavicular area, high voltage roentgen therapy or irradiation with radium may result in marked improvement of the edema and pain. Gentle massage of the arm from the wrist upward usually results in temporary relief of the less severe forms of lymphedema.

In the very severe forms of lymphedema which fail to respond to conservative treatment, a surgical procedure must be considered. The principles of the Kondoleon operation may be applied. Incisions are made extending from the wrist to the elbow on the lateral and medial surfaces of the forearm. Similar incisions are made from the inner aspect of the elbow to the axilla and externally to the posterior border of the axilla. Strips of fascia are removed through these incisions. The benefits following this operation are due to the anastomoses effected between the superficial and deep lymphatics. Improvement is reported in 50 per cent of cases in which this operative procedure is done. In extreme cases, amputation through the shoulder joint must be performed for the relief of pain.

ASTHMA AND STYES

To the Editor:—A boy, aged 12½ years, is suffering from frequent styes and nasopharyngeal catarrhs, often accompanied by asthmatic attacks. His lungs are otherwise normal, as is the heart. His tonsils and adenoids were removed several years ago and the nasal mucous membrane is frequently rather dry. His eyes are perfect. He is quite strong and indulges in heavy outdoor exercise, such as playing ball and riding a bicycle. The family history is negative. He had scarlet fever when he was a baby, but nothing else of a serious nature. The asthmatic attacks are promptly relieved by three drops of epinephrine hydrochloride under the tongue. I wonder whether you would recommend using an autogenous vaccine from the sinuses or from the pus of the styes. As for myself, I am satisfied that his asthma is due to sinus infection. He has had many skin tests. So far, nothing definite has been established as to his allergy. Please omit name

M.D., New York.

ANSWER.—The styes have no relation to the attacks of asthma or to the nasopharyngeal symptoms. A vaccine made from the pus from these styes should help prevent more styes but would probably not benefit the other symptoms. An autogenous vaccine made from the sinuses or from the sputum might help the asthma and associated rhinitis, although most workers believe that a stock vaccine works as well as an autogenous vaccine. Vaccines probably work nonspecifically and in giving injections it is important to give a large enough amount to cause considerable local reaction.

However, an asthmatic patient so young usually gives positive skin tests which help a great deal in finding out the cause for the attacks of asthma. It is highly important to make sure that he has been thoroughly tested. There are several hundred different skin tests, and while he does not need all he should be tested for those with which he comes in contact. These include pollens, epidermals, all foods containing proteins, and such miscellaneous materials as house dust, orris root, cottonseed and flaxseed. It is much better to be able to remove the cause than to treat the asthmatic attacks as they arise. In almost every city there can be found one or more physicians who specialize in work on allergy and who can do these tests completely and read them correctly.

GASEOUS DISTENTION AND MYOCARDITIS

To the Editor:—A woman, aged 60, has marked general arteriosclerosis, hypertension and cardiovalvular disease of long standing. The systolic pressure is in the neighborhood of 190 and the diastolic pressure is 90. The pulse is 60. There is marked general arteriosclerosis. The arch of the aorta extends an inch above the manubrium. The heart shows evidence of decompensation. Kidney function and urine are normal. The most annoying symptom is abdominal gaseous distention. All measures to remedy this have been unsuccessful. There is no constipation; the bowels move well. The patient takes "psylla" daily. Any help that you can give me will be greatly appreciated. Please omit name and address.

M.D., New Mexico.

ANSWER.—The sensation of gaseous distention or abdominal discomfort is not uncommonly found in patients with myocardial disease. This is particularly true in coronary involvement. While no evidence is presented to indicate that such is the case, one might assume that it is so because of the generalized arteriosclerosis. The symptom mentioned is sometimes relieved by bromides, small doses of glyceryl trinitrate or, if decompensation exists, small doses of digitalis, 0.6 cc. or more three times daily and rest, particularly after meals. If the bowels are not constipated there is no reason why psyllium seeds, which are intended for the relief of constipation, should be given. It is probable that the continued taking of an intestinal irritant, to which class psylla belongs, is the cause of the disagreeable symptom inquired about. If, however, on discontinuing this, constipation ensues, one might try the addition of fruits and vegetables to the diet, if not already done, and resort to the use of occasional retention oil enemas. If the symptoms still persist, atropine sulphate, 1/200 grain (0.3 mg.) morning and afternoon or tincture of belladonna, 0.6 cc., three times daily, or calcium gluconate, 1.3 or 2 Gm., may be tried.

EFFECTS OF COCAINE

To the Editor:—Please advise me as to the probable mode of action, the dangers, and the advisability of using a 5 per cent aqueous solution of a cocaine salt as treatment, repeated two or three times a day and over a number of days or even weeks (at longer intervals), for seasonal or other types of hay fever. Please omit name.

M.D., South Carolina.

ANSWER.—Cocaine has both an anesthetic and an astringent effect on the nasal mucous membrane. It thus relieves the irritation caused by the pollens of the spring or autumnal variety of so-called hay fever. Some individuals have a pronounced idiosyncrasy for cocaine and it is therefore advisable to use it in a dilute concentration and in small amount. If much is used, some of it may run down the throat, be swallowed and cause nausea, with perspiration and depression. A 0.5 per cent solution usually gives the desired relief and if used in small amounts may be employed for a rather long period of time without any unpleasant sequelae. There is a possibility that addiction to the drug may develop if it is used over a considerable length of time, and therefore caution should be observed.

IMPROVING DEFECTIVE VISION OF BOY

To the Editor:—A boy, aged 12 years, has uncorrected vision in the right eye, 20/20; in the left eye, 8/200. What is the accepted procedure for establishing the habit of vision in the amblyopic eye? What appliances are there on the market to aid in this condition? Please omit name.

M.D., Montana.

ANSWER.—The first step is a correct refraction of the eyes under cycloplegia. If, as the vision would tend to indicate, there is a high anisometropia with the weaker eye highly myopic, the prognosis for good vision in the weaker eye is poor. If the deficient vision is due to the presence of some pathologic condition, that should be corrected if possible. But if the eye is normal apart from the probable anisometropia, use of the deficient eye with a correcting glass by occlusion of the better eye offers the only chance of improvement of vision. There is no apparatus for that purpose. It must be added that at 12 years of age the prospects are poor.

INCONTINENCE IN ELDERLY WOMEN

To the Editor:—I have a woman patient about 76 years old who is troubled with inability to hold the urine. The least exertion, such as moving about or even coughing or sneezing, will cause micturition. She has had, in past years, a mild attack of cerebral apoplexy but that has practically cleared up. She enjoys fairly good health except for this bladder condition. She has had an operation for the repair of a cystocele and rectocele and also has a small urethral caruncle, which has had applications of silver. I have had her on antacids, sedatives and the stock "incontinence" tablet of ergot, strychnine and atropine, but nothing seems to help. I have also had her on drop doses of cantharides. The constant dribbling makes an offensive odor, although she is fastidious in her habits. Can you suggest anything? Please omit name.

M.D., Virginia.

ANSWER.—In a 76 year old patient who is troubled with inability to hold the urine, it is necessary to rule out the presence of organic disease in the bladder. This can be done by means of a careful cystoscopic examination. It might also be a good scheme to rule out obscure lesions of the central nervous system which are occasionally associated with incontinence or dribbling; for example, tabes. Naturally, it will be necessary to rule out pelvic disease, such as a large fibroid.

In a woman, aged 76, who has no organic disease of the bladder, nervous system or pelvic organs, dribbling and incontinence are frequently associated with relaxation and loss of tone. This condition can be corrected by a plastic operation on the urethra, and this may be done quite conveniently under local anesthesia.

Since the patient has been operated on without relief, it is suggested that another operation, tightening the urethra, would probably cause the symptoms to disappear.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 10. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Milwaukee, June 12. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: The *written* examination will be given in cities of the United States and Canada where there is a Diplomate who may be empowered to conduct the examination, April 1. The *general oral, clinical and pathological* examination will be held in Milwaukee, June 13. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OTOLARYNGOLOGY: Milwaukee, June 12. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

COLORADO: Denver, Jan. 3. Sec., Dr. William Whitridge Williams, 422 State Office Bldg., Denver.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, Dec. 30. *Regular.* Washington, Jan. 9-10. Sec., Dr. W. C. Fowler, 203 District Bldg., Washington.

HAWAII: Honolulu, Jan. 9-12. Sec., Dr. James A. Morgan, Room 48, Young Bldg., Honolulu.

MINNESOTA: *Basic Science.* Minneapolis, Jan. 3-4. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Regular.* Minneapolis, Jan. 17-19. Sec., Dr. E. J. Engberg, 524 Lowry Medical Arts Bldg., St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS: The examination will be held in centers where there are five or more candidates, Feb. 13-15. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEW YORK: Albany, Buffalo, New York, Syracuse, Jan. 30–Feb. 2. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, Room 315, State Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 3-6. Sec., Dr. G. M. Williamson, Grand Forks.

OREGON: Portland, Jan. 3-5. Sec., Dr. C. J. McCusker, 1014 Medical Dental Bldg., Portland.

PENNSYLVANIA: Philadelphia, Jan. 3-7. Sec., Mr. Charles D. Koch, Harrisburg.

RHODE ISLAND: Providence, Jan. 5-6. Dir., Dr. Lester A. Round, 319 State Office Bldg., Providence.

SOUTH DAKOTA: Pierre, Jan. 17. Dir., Dr. H. R. Kenaston, Bonesteel.

WASHINGTON: *Basic Science.* Seattle, Jan. 12-13. *Regular.* Seattle, Jan. 16-17. Dir., Mr. Charles R. Mayhury, Olympia.

WISCONSIN: Madison, Jan. 10-12. Sec., Dr. Robert E. Flynn, 315 State Bank Bldg., LaCrosse.

Oregon July Report

Dr. C. J. McCusker, Secretary, Oregon State Board of Medical Examiners, reports the written examination held in Portland, July 5-7, 1932. The examination covered 11 subjects. Twenty-eight candidates were examined, all of whom passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1932)	84.1, 89.9
University of Nebraska College of Medicine		(1931)	83.6
University of Oregon Medical School		(1931)	81.6, 81.7, 82.7, 83.8, 84.2, 86, 86.3, 92.4, (1932) 82.4, 82.5, 83.4, 84.1, 84.7, 85.4, 85.5, 85.5, 85.6, 86.8, 87, 87.3, 87.8, 87.9, 88.4, 88.6, 89.1

Dr. McCusker also reports 10 physicians licensed by reciprocity with other states and 4 physicians licensed by endorsement from May 31 to Sept. 14. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1925)	New Jersey
Rush Medical College		(1925)	Colorado
Detroit College of Medicine and Surgery		(1932)	Michigan
University of Michigan Dept. of Med. and Surg.		(1881)	New York
University of Michigan Medical School		(1930)	Michigan
St. Louis University School of Medicine		(1931)	Missouri
John A. Creighton Medical College		(1914)	Nebraska
University of Nebraska College of Medicine		(1930)	Washington
University of Oregon Medical School		(1927)	Washington, (1931) Montana

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1932)	N. B. M. Ex.
Harvard University Medical School		(1929)	N. B. M. Ex.
University of Oregon Medical School		(1929), (1931)	N. B. M. Ex.

Wyoming Reciprocity Report

Dr. W. H. Hassed, secretary, Wyoming State Board of Medical Examiners, reports 3 physicians licensed by reciprocity with other states and one physician licensed by endorsement at a meeting held in Cheyenne, Oct. 3, 1932. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado School of Medicine		(1931)	Colorado
Rush Medical College		(1931)	Illinois
University of Nebraska College of Medicine		(1931)	Nebraska

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Colorado School of Medicine		(1930)	N. B. M. Ex.

Book Notices

The Science of Signs and Symptoms in Relation to Modern Diagnosis and Treatment: A Textbook for General Practitioners of Medicine. By Robert John Stewart McDowall, D.Sc., M.B., F.R.C.P., Professor of Physiology, King's College, University of London. Cloth. Price, $7. Pp. 440, with 7 illustrations. New York: D. Appleton & Company, 1932.

The author, now a professor of physiology, states in the preface that at one time he took an active part in the teaching of clinical medicine. He intends here to bridge the gap between clinical work and the sciences, in which attempt he essays to cover almost the whole field of physiology and the diseases of internal medicine. The subject matter pertaining to the physiology of the nervous system, respiration and circulation is presented in fairly good detail; that on the blood, the pathologic variations, the gastro-intestinal tract and in particular the liver and bile formation, the thyroid gland, metabolism and allergy are too incomplete to be of much value. Many statements are questionable or incorrect. Such, for example, are the theory of Lewis that fatigue is the result of accumulating toxins in the muscles with swelling and compression of the nerves as the accepted cause of pain; that of Henderson, that acapnia is the real explanation of the cause of shock; that auricular fibrillation, once established, seldom disappears; that hypertension in adults is associated with the protein intake and protein restriction is necessary for its relief; that the levulose test is a delicate one for estimation of liver efficiency; that the time of occurrence of pain in peptic ulcer depends on its location; that gallstones cause mottling of the gallbladder because they are more opaque than the dye, and that thyroxine was first described by Harrington. The author is certainly not a clinician or he would not talk of the treatment of distention of the stomach, the treatment of fermentation in the stomach by beta-naphthol, or say that the Allen treatment has been found generally useful in diabetes and consists in putting the patient to bed and starving him for one week; nor has he had much experience with an oxygen tent. It would have been much better had the author associated himself with an able clinician to connect the physiologic and the clinical data.

Klinische Untersuchungen über hämatogene und bronchogene Formen der Lungentuberkulose. Von Dr. K. Lydtin, Privatdozent für innere Medizin. Nr. 45, Tuberkulose-Bibliothek, Beihefte zur Zeitschrift für Tuberkulose. Herausgegeben von Prof. Dr. Lydia Rabinowitsch. Paper. Price, 4.50 marks. Pp. 40, with 29 illustrations. Leipzig: Johann Ambrosius Barth, 1932.

This monograph is of far greater importance than its small size would indicate. It represents recent authoritative clinical and roentgenologic opinion on tuberculous reinfection. The subject matter is well presented and the roentgenograms are excellent. The author states that tuberculosis has from age to age been accounted for in all its peculiarities by the knowledge available at each particular time. Roentgen study has contributed most to the subject recently. By clinical and anatomic means, childhood tuberculosis has been greatly clarified; but outside of a few adult primary infections, the problem of adult infection is more involved and little understood. In spite of the manifold possibilities and confusion of terminology, careful roentgen study reveals two forms of beginning phthisis: the bronchiogenic or diffuse infiltrate and the hematogenous (discrete miliary) type. Although the infiltrative forms have been in favor for many years (Loeschke, Gräff) there has been a definite tendency of late toward a consideration of the miliary (hematogenous) origin of progressive tuberculosis, including many infiltrate forms (Huebschman, Schürmann, Pagel). The question now is How often does the hematogenous route operate in producing progressive disease?

Although the French are given credit for priority of discussion on the miliary type (miliaire froid, Bernand and Sayé), the Germans, notably Huebschmann and Schürmann, are credited with connecting this type anatomically with progressive tuberculosis. Schürmann, in particular, has divided the field into generalized and isolated forms. In the former there is a fine uniform dissemination; in the latter there are isolated foci that usually are larger as they decrease in number and are commonly situated in the upper parts of the lungs. The more nearly the picture resembles the chronic generalized miliary type, the more the lesions in healing produce a "lymphangitis

reticularis chronica." The cavities in such types tend to be small and "punched out" when the disease becomes progressive, but they do not tend to produce bronchiogenic metastases. On the other hand, the few scattered foci tend more to produce infiltrates and gross aspiration, more as the number decreases and as they become more apical. It is by no means certain, therefore, that the infiltrates are all bronchiogenic. One should differentiate the two types (general and isolated) on the form of lesion, the quantity of seeding and the capability of bronchial arrangement rather than on the kind of seeding. Although Schürmann did not claim that his classification would always apply clinically, Lydtin believes that it affords a working plan that may assist clinicians to find out the process by which these end stages came about.

The author then mentions the great variability of hematogenous tuberculosis. All types may be observed, from the acute generalized miliary type through ordinary tuberculosis to a symptomless disease. Clinically the conditions found are various and undependable. The spleen may or may not be large. The hilar nodes may be dense or not visible by roentgen examination. The fine lung dissemination is definite but may clear up, leaving mottling and emphysema or still later an induration. The important feature is that the postprimary bacillemia, with its resulting pathogenesis, may yield information by repeated roentgen examinations when pathogenic-anatomic means are not accessible.

The study was conducted on patients showing finely disseminated lesions throughout the lungs, in the upper lobes, in the apexes or in an isolated section of the lung, and the group was divided into two parts. Study was made, in one part, of the evolution of the lesions that persisted roentgenologically; in the other, after a roentgenologic retrogression of these miliary foci. The great majority of cases are not obtained early enough to determine anything definite; either extensive cavity formations or bronchiogenic attacks have occurred. Occasionally one is found with a diffuse fine dissemination that is apparently of hematogenous origin. Usually they present few subjective symptoms except weakness. The blood sedimentation is markedly increased. The disease may extend until the roentgenogram reveals punched-out cavities in the upper fields and a craniocaudal progression that is not possible to determine clinically. At no time is there the sudden attack that comes with a bronchiogenic form. There still lacks evidence to show whether a fine hematogenous seeding confined to the apexes may progress craniocaudally in repeated attacks (Neumann), differing from the bronchiogenic type only clinically, as Huebschmann has suggested from his anatomic studies. The author wisely states that as much care must be used with the roentgen examination as with the anatomic, because in some cases it may appear like the hematogenous seeding but an earlier picture may show a bronchiogenic type. The mild apical localizations generally tend to become benign or produce only infiltrates confined to the apexes. In fact, the less marked the disseminations the more is the resemblance to bronchiogenic spreading with medium and coarse foci. Even though they may seem to be gradual transitions from the roentgen examination, clinically they differ widely.

Of great value on the solution of the problem is extrapulmonary tuberculosis. Pulmonary changes in generalized tuberculosis with extrapulmonary foci have for a long time been known to have a predisposition to the healing or forming of apical foci, yet it is known that the seeding is like that of general miliary tuberculosis. Bronchiogenic foci, however, are rare in such cases. They occur in all progressing advanced forms either early or late, but in generalized forms with extrapulmonary metastases and in chronic miliary tuberculosis they are rare.

In the development of lesions from the retrogression of miliary foci, the author cites cases of Diehl and others to show where quickly healing cavities had developed in old healed lung foci in generalized tuberculosis. This with other evidence seems to show that the infiltrates may develop in old hematogenous lesions with or without roentgenologic remnants, as well as the bronchiogenic, but that there is no valid means of differentiating the ones by the hematogenous route (as cloudy) from the bronchiogenic (as round) as Braeuning and Redeker propose, or vice versa as Fleischner proposes. Infiltrates do not depend on the manner of seeding but on the body condition, and it may originate either endogenously or exogenously. This also was pointed out as the opinion of Schürmann.

The author prefers not to complicate matters with Ranke's theory or with any theory of allergy or immunity but considers with Koch that there is "no conformity to rule in tuberculosis." He believes, however, that Ranke saw clinically what he described. On the whole, it is a commendable and timely work with statements that are cautious and adequately conservative.

Anatomy of the Brain and Spinal Cord. By William W. Looney, A.B., M.D., Professor of Anatomy, Baylor University College of Medicine, Dallas, Texas. Second edition. Cloth. Price, $4.50. Pp. 370, with 153 illustrations. Philadelphia: F. A. Davis Company, 1932.

This work, which is designed as a textbook to be used by medical students in neuro-anatomy, is on the whole well adapted for this purpose. The author has the ability to express himself clearly and concisely and has been able to present this difficult subject in a relatively simple and straightforward manner. Out of the mass of information now available concerning the nervous system he has made a wise selection of those facts which it is most important for the physician to know and has not confused the picture by presenting too much detail. The chief defect of the book as a textbook for students is the rather small number of illustrations, some of which are not very good. In a book of this size and scope it is not possible to present all sides of controversial subjects, but in the effort to avoid confusing the student the author has been more dogmatic than necessary. In a few instances when dealing with relatively new information or subjects in dispute, references to the literature have been included. More references would aid the reader to follow out for himself in greater detail any subject in which he might be especially interested.

The Food of Protozoa: A Reference Book for Use in Studies of the Physiology, Ecology and Behaviour of the Protozoa. By H. Sandon. The Egyptian University, Publications of the Faculty of Science, No. 1. Paper. Price, 20 piastres. Pp. 187. Cairo: Misr-Sokkar Press, 1932.

This complete and carefully written summary of previous work on the nutrition of protozoa is timely in view of rapidly increasing importance of these organisms in the etiology of disease in man and other animals. The author takes up the groups of protozoa in systematic order, records the general and special food habits of each, and notes defects in present knowledge. This brings out numerous unfortunate gaps and prevents the author from drawing many general conclusions. The author discusses the effect of protozoa on the fundamental food supply of the world, on the purification of polluted waters, and on their true rôle in medical protozoology. "The first question to be considered in determining the status of any parasite is whether it feeds on the tissues of its host or on other materials, bacteria, etc., present in the body of the latter. If the food consists of bacteria or waste materials, the parasite may even serve as a scavenger and be therefore beneficial to its host." Such questions are generally overlooked in most studies in this field. An extensive bibliography is given. Proper understanding of the work demands a study of the mass of data which cannot be covered in a brief review.

Functional Disturbances of the Heart. By Harlow Brooks, M.D., Attending Physician, Fourth Medical Service, Bellevue Hospital. Everyday Practice Series. Edited by Harlow Brooks. Leather. Price, $5. Pp. 288. Philadelphia & London: J. B. Lippincott Company, 1932.

This book deals with the more important and more commonly encountered functional disturbances of the heart. The author presents these conditions in such a manner that they may be easily recognized and differentiated from organic diseases of the heart or adjacent structures. Differential diagnosis receives considerable detailed discussion, and the importance of prolonged observation to exclude organic disease is justly emphasized. The possibility of reflex cardiac symptoms referred from some distant pathologic viscus must be borne in mind and, further, it is to be recalled that existing organic heart disease may in no way be concerned with the presenting symptoms and signs. The chapters on cardiac neuroses, paroxysmal tachycardia and, more particularly, neurocirculatory asthenia are exhaustive in exposition and are well presented. The author's electrocardiographic studies in neurocirculatory asthenia show normal cardiac mechanisms, although sinus arrythmia and relatively low voltage are frequent. Myocardial changes incident to old

age are more pronounced in this syndrome, and dilatation of the aorta is frequent, especially in instances of long standing. Stress is laid on the frequency and importance of syncopal attacks with complete loss of consciousness occurring in neurocirculatory asthenia and presenting a picture simulating epilepsy. The therapeutic management of this large group of cases and the physician's proper approach to this important aspect are considered thoroughly. In the treatment of paroxysmal tachycardia the author has found quinidine "no more specifically useful" than digitalis or caffeine, although in some cases it may act favorably. Caffeine, metaphyllin, theocalcin, strychnine and spartein have no effect on the paroxysm, and when given in an attempt to influence the frequency of the attacks are apparently detrimental, although caffeine is of value when general exhaustion appears. The typographic errors, poorly punctuated sentences and occasional errors in grammatical structure that tend to disrupt the predominating easy style of this book need not in any way detract from the value of a work which embodies the author's personal ideas and conclusions based on active practice. Indeed, it is to be recommended because of its highly practical appeal.

Über Beziehungen zwischen Framboesie und Syphilis. Von Otto Schöbl, Chief, Division of Biology and Serum Laboratory, Bureau of Science, Manila, Philippine Islands, und C. M. Hasselmann, Head, Section on Dermatology and Syphilology, St. Lukes Hospital Dispensary, Manila, Philippine Islands. Band XXXVI, Beiheft 2, zum Archiv für Schiffs- und Tropen-Hygiene, Pathologie und Therapie exotischer Krankheiten. Herausgegeben von Prof. Dr. C. Mense und anderen. Schriftleitung: Geh.-Rat Prof. Dr. F. Fülleborn, Prof. Dr. M. Mayer, Prof. Dr. P. Mühlens. Paper. Price, 2.40 marks. Pp. 36, with 8 illustrations. Leipzig: Johann Ambrosius Barth, 1932.

The authors survey the basic knowledge of yaws and its relation to syphilis. They hold that the causative agent of the two cannot be differentiated by morphologic, cultural or staining methods but only in their different behavior in the host. The fundamental difference in behavior lies in the fact that Treponema pertenue is positively tropic for the ectoderm and T. pallidum for the mesoderm. The differences in the pathologic and clinical pictures as well as in the stages of development of the immunity and epidemiology are the result of this tropistic difference. A genuine immunity is produced in treponematoses which, when highly developed, shows a group immunity. The heterologous immunity appears later than the homologous. Serologic changes accompany the development of the immunity, which is manifested in a change of incubation period in subsequent infections and in a retuning of the ability of the tissues to react against the treponema. Completely developed immunity prevents the further progress of the disease. Resistance to superinfection exists toward the heterologous as well as the homologous treponema, which is not due to any so-called latent infection, because this resistance can be produced by injection with killed organisms. Both yaws and syphilis can exist together and mutually influence the course of both infections. Imitation of human yaws in all its stages is possible in monkeys by intracutaneous injection. Early chemotherapy retards the development of immunity and allows reinfection, but early vaccine therapy, successful in monkeys, offers a therapeutic possibility for increasing the immunity and preventing reinfection and the development of late stages of yaws.

Erdmann's Clinics: Excerpts Selected from the Clinics of John F. Erdmann, M.D., F.A.C.S., Professor of Surgery in Columbia University. Edited by J. William Hinton, M.D., F.A.C.S., Associate Professor of Surgery, New York Postgraduate Medical School (Columbia University). Cloth. Price, $4.50. Pp. 315, with 39 illustrations. Philadelphia & London: W. B. Saunders Company, 1932.

In these interesting clinics are set forth the surgical methods which have been successful in the hands of John F. Erdmann. They are based chiefly on shorthand reports of Dr. Erdmann's lectures given to the students in the surgical seminar at the New York Post-Graduate School and represent the mature experience obtained in forty years of successful surgical practice. The fifty-four subjects discussed cover a wide field of surgery and include the differential diagnosis of pancreatic disorders, gallstones, carcinoma of the stomach, duodenal ulcer, cancer of the rectum, intestinal obstruction, bladder tumors, uterine fibroid, hernia, and breast tumors. The presentations are brief and clear and should prove of value not only to surgeons but to general practitioners as well.

Protoplasmic Action and Nervous Action. By Ralph S. Lillie, Professor of Physiology, The University of Chicago. Second edition. Cloth. Price, $3. Pp. 417. Chicago: University of Chicago Press, 1932.

The first edition of this work, which appeared in 1923, has been an invaluable summary and source book for all students of general physiology. The analytic investigation of vital processes is advancing rapidly, but the way in which the simpler processes of inorganic physics and chemistry are combined to yield the properties of living substance remains obscure. When the materials and energies of the surrounding world unite to constitute the organism, new qualities and modes of activity come into existence. The biologic interest, then, centers in the conditions and patterns of this combination and in the nature of the resulting unity; that is, in the integrative functions. It is to these that attention is especially directed in this work. "And the problem of integration resolves itself largely into the problem of the conditions under which protoplasmic processes, although spatially separated, mutually influence one another." Protoplasmic transmission is systematically reviewed, with a detailed analysis of the structure of protoplasm, its physical, chemical and bio-electrical properties, and the laws of excitation and conduction. Particular phases of the problem are clarified by the construction of mechanical models in which the factors under investigation are isolated from the complex organization of the living stuff. Thus, Dr. Lillie's simple and illuminating experiments on the behavior of iron wires immersed in nitric acid reproduce with remarkable fidelity some of the most distinctive peculiarities of nervous transmission and give a convincing demonstration of some of the chemical and physical components of the process and the ways in which these may be actually combined in the living nerve. The changes in the revised edition are chiefly in the form of notes appended to the chapters, giving additional references to recent literature and advances in theory or interpretation necessitated by this rapid accumulation of experimental work with greatly improved methods and apparatus. The book is adequately indexed and well documented with citations of literature.

Diet Prescriptions. Compiled from Accepted Authorities by Oscar Baer, M.D. Cloth. Price, $5. 75 Forms. Niagara Falls: Arnson's Service & Supplies, 1932.

The underlying principle of this book is certainly excellent. The author attempts to give a collection of diets with flexible menus which can be used under varying social or economic conditions. The complementary sheets, which are furnished to physicians, make it possible for a more intelligent dieting than has frequently been used in the past. The book, frankly, is a collection from various authors. It has the value of avoiding fads and fancies and on the whole is a practical useful volume.

La distomatosis hepat..a en Cuba. Por los dres. Pedro Kouri y Rogelio Arenas. Tomo I. Paper. Pp. 175, with illustrations. Havana: Gutiérrez y Ca., S. en C., 1932.

This is a monographic record of cases of liver fluke disease in Cuba. After brief introductory items come three extensive chapters on human liver fluke disease in Cuba caused by Fasciola hepatica, the well known European sheep liver fluke now cosmopolitan in its distribution. These articles are reprinted from the periodical *Vida nueva;* other material in this work is new. The parasites are common in Cuban cattle and the human cases described originated on the island. The first article covers two autochthonous cases of the parasite in man. The second and third articles deal with diagnosis and treatment and include other cases of the disease. The authors add reports of cases reported from Cuba by other writers; one of these concerns Clonorchis sinensis. Nine photomicrographs give fine representations of the eggs and embryos of the parasite.

The Diabetic A B C: A Practical Book for Patients and Nurses. By R. D. Lawrence, M.A., M.D., F.R.C.P., Physician in Charge Diabetic Department, King's College Hospital. Second edition. Boards. Price, 3s. 6d. Pp. 56. London: H. K. Lewis & Company, Ltd., 1932.

This pamphlet is published expressly for the benefit of diabetic patients using the author's line ration scheme of diet calculation. The scheme seems to be without special merit. It is merely a complicated method of arriving at the fairly simple formulation of a diabetic diet. The author has succeeded in confusing a subject that has been treated lucidly in many other diabetic handbooks.

Medicolegal

Liability for Unauthorized Autopsy

(Streipe v. Liberty Mut. Ins. Co. et al. (Ky.), 47 S. W. (2d) 1004)

Streipe, in the course of his employment, fell from a ladder and died in a few minutes. Apparently, the insurance carrier of Streipe's employer requested the coroner to order an immediate autopsy. Without obtaining the consent of Streipe's widow, the coroner directed Dr. Carter to perform an autopsy. Two physicians attended the autopsy, but only as observers for the insurance company. Solely from evidence obtained by the autopsy, compensation under the Kentucky workmen's compensation act was denied the widow, on the ground that Streipe had died from myocarditis.[1] Subsequently the widow brought an action to recover damages for the unlawful mutilation or dissection of Streipe's body. She named as defendants the coroner, the insurance company, the physician who performed the autopsy and the two physicians who were present as witnesses, all of whom, she charged, had conspired to perform the autopsy without her consent. The trial court gave a peremptory instruction in favor of all the defendants except the coroner, and the jury returned against him alone a verdict for $4,500. The plaintiff then appealed to the Court of Appeals of Kentucky, complaining of error in the trial judge's instruction.

A surviving spouse or next of kin, said the Court of Appeals, in the absence of a different disposition by will, has the right to the possession of a dead body for the purpose of preservation and sepulture. The law will recognize and protect this right from unlawful invasion, by awarding damages for the injury to the feelings that results from any wrongful mutilation or mishandling of the corpse. If the autopsy in this case was not authorized by the widow or by some provision of law, it was illegal and wrongful. The widow admittedly did not authorize it. The only question to be determined, therefore, is whether or not the coroner had the right to do so.

Section 528, Kentucky Statutes, provides in part as follows:

> It shall be the duty of the coroner, upon request, or when he has reason to believe a crime has been committed, to hold an inquest upon the body of any person slain, drowned or otherwise suddenly killed.

When a lawful inquest is being held and a postmortem examination is deemed necessary, within the limits and under the circumstances stated the coroner may cause an autopsy to be performed. A coroner has no lawful right, however, to conduct an inquest or to cause an autopsy to be performed in the course of an inquest, unless he has reason to believe that a crime has been committed or has been requested to do so by some one who is authorized to make such a request. An insurance carrier, with merely a private interest to serve, does not come within the purview of that provision. Certainly the rights of the surviving spouse or of the next of kin in the body of the deceased cannot be subordinated to anything less than an overriding public interest, sanctioned by law. The sole authority of a coroner for ordering an autopsy is the section of the Kentucky Statutes just quoted. That section confers on the coroner no authority to order an autopsy in a case like this. Since the autopsy was wholly unauthorized and illegal, the coroner and all persons who assisted, advised, commanded, countenanced or cooperated in conducting it or who, if it was done for their benefit, approved of it after it was done, are liable to the plaintiff for the damages suffered by her as a consequence of the wrongful act.

The trial court was of the opinion that the physician employed by the coroner to perform the autopsy could not be held liable. The Court of Appeals, however, was of a different opinion. A physician who performs an autopsy at the request of the coroner, said the Court of Appeals, is not liable in damages if the order of the coroner was authorized and valid. If, however, the coroner exceeds his authority or acts without authority, his order or request affords no protection to a physician who performs the illegal autopsy. The question concerning the liability of the coroner's physician stood on a parity with that of the coroner and should have been submitted to the jury.

1. Streipe v. Hubbuch Bros. & Wellendorf, 25 S. W. (2d) 358, J. A. M. A. 96: 975 (March 21) 1931.

The question concerning the liability of the two physicians who were present at the autopsy only as observers for the insurance company falls into a different category. All they did was to observe the autopsy performed by the coroner's physician. Neither of these two physicians participated in any manner in the actual autopsy. They had a right to assume from appearances, in the absence of anything to put them on inquiry, that the autopsy was lawful and proper. The trial court properly instructed the jury in their favor.

As to the insurance company, the evidence tended to show that when its agent learned of the accident the company was confronted with a potential liability because of Streipe's death, *if* the death resulted from an accident. It had a motive for obtaining an autopsy. If it could establish that the death resulted from disease, and not from traumatic injury arising out of and in the course of employment, the insurance company would be relieved of a substantial liability. The insurance agent therefore communicated with the coroner, events moved with celerity, and the coroner proceeded to have an immediate autopsy. The widow of the deceased was not consulted or advised concerning the matter. Her rights were not respected. The insurance company, the evidence showed, paid the coroner's physician for performing the autopsy a fee much greater than the statutory fee allowed for such services. The insurance company greatly desired the autopsy to be held, it was made solely for its benefit, and it frankly approved of all that was done. The widow's claim for compensation under the workmen's compensation act was defeated by the insurer solely by evidence adduced from the performance of the illegal autopsy. The circumstances proved and the inferences fairly to be deduced from all the evidence, continued the court, warranted a submission of the case to the jury as against the insurance company, as well as the coroner and the physician who performed the autopsy.

Accordingly, the judgment, so far as it was in favor of the two physicians who observed the autopsy only as witnesses, was affirmed; but so far as it was in favor of the insurance company and the physician who performed the autopsy it was reversed and a new trial was ordered.

Statute of Limitations Suspended by Fraudulent Concealment.—The plaintiff alleged that because of the negligence and unskilfulness of the defendants her bladder and other organs were unnecessarily injured and would not function properly. She knew of the injury immediately after the operation. She alleged, however, that the defendants assured her that it was only slight and temporary, that it would in time heal itself, and that she would be all right. She was induced by those representations, she said, to refrain from making further inquiry as to her condition. When those representations, said the court of appeal of Georgia, division 2, when made by the defendants, were known by them to be false, and they knew that the injury to the bladder was permanent; when they made those representations with intent to deceive the plaintiff, and when the relation between the plaintiff and the defendants was a confidential relation, and the defendants owed to the plaintiff the duty of advising her of her true condition and she was deceived by them, the defendants were guilty of such fraud as deterred the plaintiff from bringing an action for damages against them This suit, which was brought within the statutory period of limitations after the plaintiff in the exercise of ordinary care discovered that the injury to her bladder was permanent, was therefore not barred by the statute of limitations.—*Colvin v. Warren (Ga.) 163 S. E. 268.*

Society Proceedings

COMING MEETINGS

American College of Physicians, Montreal, February 6-10. Mr. E. R. Loveland, 133-135 South 36th Street, Philadelphia, Executive Secretary.

Clinical Orthopedic Society, Chicago, January 12-14. Dr. E. B. Mumford, Chamber of Commerce Building, Indianapolis, Secretary.

Society of American Bacteriologists, Ann Arbor, Mich., December 28-30. Dr. James M. Sherman, Cornell University, Ithaca, N. Y., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Cancer, New York

16: 933-1256 (Sept.) 1932

Analysis of One Hundred and Four Cases of Carcinoma of Large Intestine. H. T. Karsner and B. Clark, Jr., Cleveland.—p. 933.
Buccal Carcinoma. D. E. C. Mekie, Edinburgh, Scotland.—p. 971.
*Carcinoma of Prostate. J. R. Caulk, St. Louis, and S. B. Boon-Itt, Bangkok, Siam.—p. 1024.
*Primary Tumors of Os Calcis: Study of Thirty-Two Cases with Review of Literature. B. L. Coley and G. S. Sharp, New York.—p. 1053.
Xanthoma of Breast. C. D. Haagensen, New York.—p. 1077.
Lipomas. F. E. Adair, G. T. Pack and J. H. Farrior, New York.—p. 1104.
Radiotherapy for Endothelial Myeloma. A. U. Desjardins, Rochester, Minn.—p. 1121.
Roentgenologic Diagnosis of Neoplastic Diseases of Stomach. B. R. Kirklin and H. M. Weber, Rochester, Minn.—p. 1134.
Genetic Studies on Transplantation of Tumors. J. J. Bittner, Bar Harbor, Maine.—p. 1144.
Malignant Cells of Walker Rat Sarcoma No. 338. Margaret Reed Lewis and W. H. Lewis, Baltimore.—p. 1153.
Solitary Myeloma (Plasmacytoma) of Femur: Report of One Case. W. G. Harding 2d, and T. S. Kimball, Los Angeles.—p. 1184.
*Is Increase of Cancer Real or Apparent? Study Based on Statistics of Canada. Madge Thurlow Macklin, London, Ont., Canada.—p. 1193.
End-Result of Cancer Cases Treated in Philadelphia Hospitals in 1923, as Shown by Special 1930 Follow-Up Studies. A. H. Estabrook.—p. 1206.
Value of Statistical Studies of Cancer Problem. E. B. Wilson.—p. 1230.
Cancer of Cervix: Immediate Necessity for Earlier Diagnosis and Treatment. J. C. Bloodgood, Baltimore.—p. 1238.

Carcinoma of Prostate.—In 222 cases of carcinoma of the prostate, Caulk and Boon-Itt used the cautery punch operation in conjunction with radium and roentgen therapy. They believe that it is the method of choice for relieving obstruction and retarding the progress of the disease. Seventy-two per cent of the cases thus treated received complete relief from obstruction. Twenty-nine per cent of the patients lived or are living over three years and 10 per cent over five years, a longer duration of life than that afforded by prostatectomy. The mortality from the operation, in spite of the fact that it was done in many instances on extremely ill patients, on whom prostatectomy would not have been considered, is 2.5 per cent. The mortality rate from prostatectomy in this disease, in the authors' clinics, is 17 per cent. Hospitalization has been less than with prostatectomy. The punch operation affords a definite means of accurately diagnosing cancer of the prostate in 80 per cent of all cases, early or late, which indicates that the disease, even in apparently early cases, is present throughout the substance of the gland.

Primary Tumors of Os Calcis.—According to Coley and Sharp, the os calcis is an infrequent site of a primary bone tumor; but thirty-two cases were found in a combined study of the records of the Memorial Hospital and of the Bone Sarcoma Registry of the American College of Surgeons. A positive preoperative diagnosis is difficult. An accurate diagnosis can be obtained in most cases only by histologic study. If aspiration biopsy is inconclusive, as is often the case, a surgical biopsy is indicated. In osteogenic sarcoma the treatment is early amputation. The authors do not favor prolonged irradiation preliminary to amputation but, if adequate radiation can be delivered in a brief period, followed promptly by amputation, they see little objection to its employment, though they have no data to suggest that the results are thereby improved. Endothelial myeloma, being an extremely radiosensitive tumor and characterized by early and wide dissemination to other bones as well as to the lungs, is best handled by irradiation with high voltage roentgen rays and injections of mixed toxins of erysipelas and B. prodigiosus. Giant cell tumor may be treated successfully by irradiation alone. There are, however, a number of cases in other bones in which irradiation has been used in the past in doses that have caused permanent damage to skin, soft parts and bone. The response to irradiation varies considerably in individual cases of giant cell tumor. Thorough curettage, followed by an escharotic, such as zinc chloride or phenol (carbolic acid) and alcohol, is an established method of dealing successfully with these cases, particularly when the tumors are well defined and have not broken through the cortex and extended into the soft parts. The combined case records of the Memorial Hospital and the Bone Registry show that an early, correct diagnosis was seldom achieved and that there was no well conceived plan of treatment for primary bone tumors of the os calcis.

Is Increase of Cancer Real or Apparent?—Macklin states that cancer is increasing, and it is increasing particularly in the age group over 60. The reason is not that it is occurring at progressively younger ages or attacking larger percentages of the younger population. Despite its increase, deaths are fewer from all causes now than they were. More ground has been won from the ravages of infectious disease than has been lost to those disorders which are dependent on inherent qualities in the chemical and physical makeup of the individuals. Cancer is increasing because, by preventive methods, there has been created a larger population to grow old; and having grown old, they are kept from dying of those ills from which they formerly suffered. The author bases these conclusions on the statistics of Canada. There is strong ground for believing that a similar analysis of the statistics of any other country would lead to the same conclusions. It is true that there may be racial differences in immunity to cancer, but the author's conclusion will probably prove universal; namely, that excellent public health measures and high cancer rates are inseparable, at least for the present. Those who point to the low cancer rates existing among primitive peoples, and who state that cancer is a disease of modern civilization, neglect to call attention to the fact that preventive medicine is itself a triumph of modern civilization.

American Journal of Diseases of Children, Chicago

44: 485-700 (Sept.) 1932

Contagious Factor in Etiology of Rheumatic Fever. W. R. F. Collis, London, England.—p. 485.
Scarlet Fever: Survey of Personnel of Children's Hospital, Including Prophylaxis and Comparative Studies of Special Bacteriologic and Serologic Methods. S. C. Peacock, Marie Werner and Charlotte Colwell, Chicago.—p. 494.
Frequency of Mongoloid Imbecility: Question of Race and Apparent Influence of Sex. A. Bleyer, St. Louis.—p. 503.
Physical Unfitness in Preparatory School. W. R. P. Emerson, Boston.—p. 509.
Amount of Ultraviolet Radiation Needed to Cure Rickets with Respect to Area of Skin Exposed. A. Knudson, Albany, N. Y.—p. 524.
Rickets: Comparative Value of Several Light Sources for Cure and Prevention. A. Knudson, Albany, N. Y.—p. 531.
Renal Dwarfism and Rickets. S. Karelitz and H. Kolomoyzeff, New York.—p. 542.

American Journal of Pathology, Boston

8: 477-638 (Sept.) 1932

*Melanoma Studies: I. Dopa Reaction in General Pathology. G. F. Laidlaw, New York.—p. 477.
Id.: II. Simple Technic for Dopa Reaction. G. F. Laidlaw and S. N. Blackberg, New York.—p. 491.
*Study of Repair of Articular Cartilage and Reaction of Normal Joints of Adult Dogs to Surgically Created Defects of Articular Cartilage, "Joint Mice" and Patellar Displacement. G. A. Bennett and W. Bauer, with surgical assistance of S. J. Maddock, Boston.—p. 499.
Studies in Pathology of Development: II. Some Aspects of Defective Development in Dorsal Midline. N. W. Ingalls, Cleveland.—p. 525.
*Studies on Nature of Negri Body. W. P. Covell and W. B. C. Danks.—p. 557.
Circulation in Pancreatic Lobule After Partial Venous Obstruction. J. S. P. Beck and P. Peterson, Nashville, Tenn.—p. 573.
Simple Method for Studying Cytology of Infectious Myxoma of Rabbit. Margaret Reed Lewis and R. E. Gardner.—p. 583.

Melanoma Studies.—Laidlaw observed that the dopa reaction is specific for two kinds of cells, for melanoblasts (a term which includes all melanin-producing cells as distinguished from mere phagocytes), and for myelogenous leukocytes (cells that have no known connection with melanin production). On the basis of his experiments and a review of the literature the author draws the following conclusions: 1. Bloch's dopa doctrine is endorsed as the best working hypothesis of melanin

production in human skin. 2. The dopa reaction is indispensable in the study of pigmented moles, melanoma and the movements of melanin. 3. In the identification of melanoblasts with the dopa reaction, only the positive cells are significant. 4. The appearance of dopa-positive dendritic cells in nonpigmented acanthoses remains unexplained. 5. In the controversies that have arisen over the dopa reaction, Bloch's histologic observations are corroborated.

Repair of Articular Cartilage.—Studies concerning the repair of surgical defects made in hyaline cartilage of normal adult dog joints, the joint reaction to loose bodies of cartilage and cartilage with attached bone, and the joint reaction to displaced patellae are reported by Bennett and Bauer. Each type of lesion was examined after periods of four, twelve, twenty and twenty-eight weeks' duration. Some form of repair occurred in seven of the nine defects that were made entirely within the articular cartilage of the weight-bearing and nonweight-bearing articular surfaces. The two exceptions were represented by lesions in the patellar groove of four and twelve weeks' duration. In the defects that extended into subchondral bone and in those defects in which pannus, accompanying displaced patellae, covered the defects, the reparative changes passed through stages of fibrous tissue and fibrocartilage to the formation of an imperfect form of hyaline cartilage. The fibrous tissue originated in the connective tissue of the bone marrow, in the marginal synovial membrane and apparently, in some instances, from articular cartilage cells. Histologic evidence of repair of cartilage by proliferation of cartilage cells was present in four of the six defects that were entirely within cartilage and not covered by pannus. Such proliferation was most marked in the lesions made in the weight-bearing surface of the femoral condyle. In no instance was repair complete or perfect within the twenty-eight week period. In the majority of lesions, the repairing tissue filled but a small portion of the defect crater. In the authors' experiments, marked intra-articular changes similar to those of human hypertrophic arthritis occurred in every joint in which the patella became displaced. Such joints showed pannus formation, hypertrophied synovial villi, "joint mice" formation and proliferative and degenerative changes in the articular cartilage and subchondral bone at the articular margins. The presence of small defects in cartilage, or defects that extended into subchondral bone, was not a cause of important joint changes in their experiments. Cartilage and bone and cartilage fragments returned to the joints from which they were removed did not produce any significant intra-articular changes. The bone of the bone and cartilage fragments had been resorbed or was in the process of resorption, whereas the cartilage had remained viable in a large measure in all instances. In the majority of specimens the implanted loose body had been surrounded by connective tissue and thus removed from the intra-articular space. Extensive atrophy of cartilage and pannus formation over the surface of cartilage occurred within a twelve week period, when disarticulation through the knee joint was performed. Their observations suggest the importance of the apposition and weight-bearing of adjoining articular surfaces in maintaining the proper nutrition of hyaline cartilage. They describe the application of a method of capillary and blood vessel injection with a substance that is easily found on macroscopic and microscopic examination.

Studies on Nature of Negri Body.—Covell and Danks state that their cytologic evidence, with that of other authors, together with their experimental evidence, is not compatible with the protozoan or organismal theories concerning the nature of the Negri bodies. The contention that they arise from constituents already present in the nerve cell as a result of the action of the virus is in agreement with the authors' experiments, but they consider the evidence for the participation of the mitochondria, neurofibrils and nucleolus as inconclusive. Both the Negri bodies and the smaller atypical lyssa bodies are probably formed by alterations in the basophilic Nissl substance, the fundamental ground substance of the cell, and by addition of variable amounts of basophilic material of nuclear origin. There is no evidence that organisms on the borderline of microscopic visibility are cloaked with these cellular components in accordance with the chlamydozoal hypothesis.

American Journal of Psychiatry, Baltimore

12: 197-414 (Sept.) 1932

The Brain Problem, in Relation to Weight and Form. H. H. Donaldson, Pittsburgh.—p. 197.
Crime and Endocrine Glands. L. Berman, New York.—p. 215.
Mental Disorders in Siblings. D. G. Humm.—p. 239.
Fragments of Schizophrenic's "Virgin Mary" Delusions. J. M. Thomas, Boston.—p. 285.
Body Interest in Children and Hypochondriasis. D. M. Levy, New York.—p. 295.
Psychosis: Its Importance as Presenting Symptom of Brain Tumor. L. J. Adelstein and M. G. Carter, Los Angeles.—p. 317.
Clinical Study of Psychoses Associated with Various Types of Endocrinopathy. J. Notkin, New York.—p. 331.
The Psychiatry of Ultraism. B. Freedman, Brookline, Mass.—p. 347.
Blood Cholesterol Studies in Mental Disease. P. G. Schube.—p. 355.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

28: 293-420 (Sept.) 1932

Roentgen Diagnosis During Course of Roentgen Therapy of Epitheliomas of Larynx and Hypopharynx. H. Coutard and F. Baclesse, Paris, France.—p. 293.
Roentgen Therapy of Epitheliomas of Tonsillar Region, Hypopharynx and Larynx from 1920 to 1926. H. Coutard, Paris, France.—p. 313.
*Development of Technic and Results of Treatment of Tumors of Oral and Nasal Cavities. E. G. E. Berven, Stockholm, Sweden.—p. 332.
*Roentgenologic Evidence of Fetal Death. M. A. Schnitker, F. C. Hodges and F. E. Whitacre, Chicago.—p. 349.
Hemangioma of Vertebra. J. Ireland, Chicago.—p. 372.
*Method of More Clearly Visualizing Lesions of Sigmoid. W. H. Stewart and H. E. Illick, New York.—p. 379.
Work in First Decade of Roentgenology. E. Thomson, Lynn, Mass.—p. 385.
Ossification in Extremities of the New-Born. T. O. Menees and L. E. Holly, Grand Rapids, Mich.—p. 389.
Shutter Grid Permitting Plural Records on Same Film. H. Thomas, Boston.—p. 391.

Treatment of Tumors of Oral and Nasal Cavities.—In the radiation treatment of carcinoma of the oral and nasal cavities Berven uses, at the Radiumhemmet, a combination of radium and endothermy for the treatment of primary tumor, and a combination of radium and conservative surgery for the treatment of lymph node bearing areas. The routine treatment of the primary tumor consists of an initial teleradium treatment which, after the tumor has become clean, diminished in size and better delimited, is followed by endothermy and by simultaneous interstitial implantation of radium needles around the coagulated area. The treatment of the lymph node bearing areas consists of the application of teleradium simultaneously with the treatment of the primary tumor. Surgical dissection is indicated after the teleradium treatment, if any movable easily operable glandular metastases remain. Otherwise only teleradium is used. Of 278 patients suffering from carcinoma of the oral cavity (tongue, sublingual region, cheek and mandible) 75, or 27 per cent, are free from symptoms from five to eleven years. Of 18 patients suffering from epithelioma of the tonsils 7, or 39 per cent, are free from symptoms three years or more. Of 35 patients suffering from sarcoma of the tonsils 15, or 43 per cent, are free from symptoms three years or more. Of 64 patients suffering from carcinoma of the upper jaw 22, or 36 per cent, are free from symptoms from one to eight years. Radiotherapy should be practiced in thoroughly equipped radiotherapeutic clinics with daily and intimate cooperation between scientists who are devoting themselves entirely to this work, namely, surgically trained radiologists, as well as physicists and pathologists.

Roentgenologic Evidence of Fetal Death.—Based on the study of roentgenograms of 176 cases of pregnancy in which the fetal age at the time of roentgen examination ranged from three and three-eighths months to over term and in fourteen of which the fetus was dead, Schnitker and his associates drew the following conclusions: 1. Roentgenographic demonstration of overlapping of the skull bones of a fetus in utero is fairly reliable evidence that the fetus is dead, provided the patient is not in labor and that care has been taken to exclude pseudo-overlapping due to the overlying images of suture and fontanels. 2. Absence of overlapping means little. Conclusive evidence is lacking as to the exact relationship between the date of fetal death and the development of the sign, but some time must elapse. A faint fetal shadow may mask overlapping; hydrocephalus may prevent its development. 3. Spinal angulation and thoracic collapse appear to be of doubtful value as criteria of fetal death. 4. It is dangerous to diagnose decal-

cification in every instance of a faint or blurred fetal shadow because early in pregnancy the appearance may be due to a failure to calcify rather than a loss of calcium previously present and, even in well calcified skeletons, excessive amniotic fluid, respiratory movement and many technical factors can produce the same appearance. 5. Anthropometric data published by Scammon and Calkins allow a reasonably accurate opinion as to the age of a fetus if its occipitofrontal diameter is known. Disproportion between ages thus calculated and the supposed duration of gestation constitutes a valuable criterion of fetal death, and accurate fetometry by stereoroentgenographic methods ought to improve the validity of the diagnosis. 6. Absence of any one or all of the criteria does not exclude the possibility that a fetus is dead because they all depend on the degree of maceration. The roentgenographic diagnosis of movement of a fetal part occurring during the roentgen examination constitutes conclusive evidence of fetal life.

Lesions of Sigmoid.—Stewart and Illick state that examination of the colon by means of oblique roentgenograms and roentgenoscopy is a well established routine procedure which has been in use for many years; in spite of the routine use of such procedure, malignant and other lesions of the sigmoid are overlooked. The coils of terminal ileum which contain barium and the low position of the cecum as well as a redundancy of the sigmoid itself contribute factors that are almost insurmountable unless partial or complete obstruction has already taken place. Oblique roentgenograms of the sigmoid when only the pelvic colon contains barium overcome these defects and permit more exact diagnosis. The sigmoid, posterior rectum and anal region are clearly outlined by this method, and clear detail is obtained of the entire redundant sigmoid. The authors hope that, when as much effort is spent in the roentgenologic examination of the pelvic colon as is now spent in that of the stomach, the diagnosis of the early lesions of the sigmoid will be perfected.

Archives of Dermatology and Syphilology, Chicago

26: 397-596 (Sept.) 1932

Schizosaccharomycosis: II. Clinical (Mycide) Forms: Pityriasis Rosea of Gibert; Its Etiology and Pathogenesis. T. Bendek, Leipzig, Germany.—p. 397.

Syphilitic Bursopathy of Verneuil: Report of Two Cases. J. H. Swartz and M. M. Tolman, Boston.—p. 419.

Brucella Dermatitis. L. F. Weber, Chicago.—p. 422.

Fissured, Granulomatous Lesion of Upper Labio-Alveolar Fold. R. L. Sutton, Jr., Kansas City, Mo.—p. 425.

Dermatitis Gangraenosa Infantum in Course of Scarlet Fever. H. D. Pasachoff and N. Sobel, New York.—p. 428.

*New Form of Therapy for Psoriasis. H. S. Campbell and K. Frost, Los Angeles.—p. 435.

Erythrose Peribuccale Pigmentaire of Brocq: Report of Case with Capillary and Histologic Study. M. E. Obermayer and S. W. Becker, Chicago.—p. 444.

Perlèche in Adults: Report of Four Cases Apparently Due to Monilia, with Experimental Observations. L. J. Frank, Kansas City, Mo. —p. 451.

*Acne Vulgaris: Heredity in Etiologic Background. J. H. Stokes and A. D. King, Philadelphia.—p. 456.

Self-Sterilizing Powers of Skin: III. Carbohydrate Metabolism. T. Cornbleet, Chicago.—p. 463.

*Possible Explanation for Localization of Ringworm Infection Between Toes: Hydrogen Ion Concentration of Interdigital Spaces of Feet. O. L. Levin and S. H. Silvers, New York.—p. 466.

Recurrence in Lichen Planus. L. W. Lord, Baltimore.—p. 471.

Painful Tongue. D. W. Montgomery and G. D. Culver, San Francisco. —p. 474.

Effect on Skin of Emotional and Nervous States: IV. Rosacea Complex, a Reappraisal, with Especial Reference to Constitutional Background and Rationale of Treatment. J. H. Stokes and H. Beerman, Philadelphia.—p. 478.

Ringworm of Scalp: Treatment with Thymol and Oil of Cinnamon. E. C. Loomis, Cleveland.—p. 495.

Optical Specificity of Dioxyphenylalanine Oxidase, the Melanogenic Enzyme of Skin. S. M. Peck, H. Sobotka and J. Kahn, New York. —p. 499.

New Form of Therapy for Psoriasis.—Campbell and Frost give the results obtained in fifty patients with psoriasis treated by the intramuscular injection of an alcoholic suspension solution of autogenous scales. In ten cases the patients did not continue therapy. In thirty cases with generalized eruptions, cure was obtained in ten, improvement in nineteen and aggravation of the condition in one. In none of the ten cases in which there were only a few lesions did healing result, but in two improvement occurred. The authors believe that this method of treatment is of specific value in certain cases, but because of the long latent period, associated with decided exaggeration of the eruption before healing occurs, it should be adopted only in cases of generalized eruptions of long standing that have been resistant to other forms of treatment.

Acne Vulgaris.—Stokes and King conclude from a study of 82 cases of seborrheic dermatitis, 143 cases of acne vulgaris and 100 normal controls that there is a familial and heritable element in predisposition to acne vulgaris, which should be considered in prognosis and treatment. The incidence of acne in the parents of patients with acne is twenty-six times that in the parents of persons who have never had acne There are reasons to suspect that the heritable factor involves the element of pyogenic susceptibility. Patients with seborrheic dermatitis exhibited a more pronounced family history of atopy (28 per cent) than did those with acne (13 per cent). The heritable factors are probably complex and do not follow a simple mendelian distribution. The possibilities involved in the study of identical twins are largely exhausted, and emphasis should now be placed on the obtaining of adequate family histories.

Ringworm Infection of Toes.—Levin and Silvers report briefly on sixteen cases of ringworm infection of the toes and state that the p_H reaction of the interdigital spaces of the feet and axillae is higher than that of the normal control skin. The different reaction obtained in the axillae can be explained as being due to the apocrine glands which secrete a sweat different from that of the eccrine sweat glands. The changed alkaline reaction obtained from the interdigital spaces must be explained by reason of physicochemical changes of the evaporated sweat, for no histologic differences have been discovered in these areas. To counteract the tendency toward a change in the reaction of the sweat, the authors employ a 1 to 2 per cent salicylic acid powder both in the prophylaxis and in the treatment of the scaling and macerated type of dermatophytosis of the toes.

Endocrinology, Los Angeles

16: 455-596 (Sept.-Oct.) 1932

Studies on Thyroid Medication: I. Some Conditions Determining Hematopoietic Effects. R. G. Hoskins and E. M. Jellinek, with technical assistance of L. Delaura, Boston.—p. 455.

*Nervous Manifestations of Exophthalmic Goiter at Different Stages in the Disease. W. O. Thompson, Chicago.—p. 487.

Optimal Weight Estimation: The Method of Willoughby. E. K. Shelton, Santa Barbara, Calif.—p. 492.

Action of Extracts of Anterior Pituitary and Pregnancy Urine on Testes of Immature Rats and Monkeys. E. T. Engle, New York.—p. 506.

Experimentally Induced Descent of Testis in Macacus Monkey by Hormones from Anterior Pituitary and Pregnancy Urine: Rôle of Gonadokinetic Hormones in Pregnancy Blood in Normal Descent of Testes in Man. E. T. Engle, New York.—p. 513.

*Studies Indicating Function of Cortin. F. A. Hartman, K. A. Brownell and J. E. Lockwood, Buffalo.—p. 521.

Pubertas Praecox in Girl of Four: Attempt to Estimate Follicular and Anterior Pituitary Sex Hormones. C. L. Bennett, Los Angeles.—p. 529.

*Treatment of Anemia of Myxedema. J. Lerman and J. H. Means, Boston.—p. 533.

Experiments on Endometrial Hyperplasia. J. C. Burch, J. M. Wolfe and R. S. Cunningham, Nashville, Tenn.—p. 541.

Stimulation of New Bone-Formation with Parathyroid Extract and Irradiated Ergosterol. H. Selye, Montreal, Canada.—p. 547.

Nervous Manifestations of Exophthalmic Goiter.—In many quarters there has been a tendency to attribute the peculiar nervous manifestations of exophthalmic goiter to an abnormal thyroxine. Thompson in examining a large number of patients over a long period of time suggests that the nervous manifestations of the disease, which may be grouped under the general heading of emotional instability, may be accounted for in a simpler manner. Briefly, it would appear that most patients who have exophthalmic goiter were emotionally unstable before the development of the disease; that when the disease develops, all reactions that occur are merely exaggerations of reactions that previously were present in less intense form; and that when thyroidectomy restores the basal metabolic rate to normal, the patients themselves are merely restored to their former state of emotional instability. However, fairly calm and apparently stable persons sometimes get the disease, possibly because the cause is acting with great intensity and susceptibility is merely relative. In such patients the peculiar nervous manifestations are much less marked, often to the point at which the diagnosis is doubted or the patients are thought to have toxic adenoma. When they recover they do not manifest the emotional instability of other patients. In

other words, it would appear that the degree of emotional instability that is present in the disease depends largely on the degree of emotional instability that was present before its development. The author makes no attempt to state what the precise pathologic changes in exophthalmic goiter are.

Function of Cortin.—Hartman and his associates describe the effect of cortin on the symptoms of suprarenal insufficiency in man and animals. They state that cortin is intimately related to the functions of muscle, nervous tissue, kidney and gonads. Perhaps when other tissues are investigated they will be found to be just as directly concerned. It is difficult to explain these effects through the primary action on any one function of the body. Cortin, therefore, seems to be necessary for the activity of the various tissues of the body. They suggest that it may be a general tissue hormone. The authors give proof that cortin affects the nervous system as well as the muscular system. The early fatigue of the reflexes is offered as a partial explanation of the reduced heat production of cortin deficient animals on exposure to cold. Low blood sugar levels are not responsible. The lowered resistance to heat in cortin deficient animals may be partly due to reduction in the shift of water from the reservoirs. Cortical extract shortens the interval between menstrual periods in normal women. This extract when injected in sufficient amount inhibits estrus in normal white rats. The authors describe the effects of cortin on metabolism, growth, toxin resistance and kidney function.

Treatment of Anemia of Myxedema.—In accordance with the results obtained in seven cases, Lerman and Means state that anemia in myxedema is a frequent occurrence and often is associated with gastric anacidity. In some cases the hematopoietic effect of thyroid is sufficient to cause the anemia to disappear slowly; in others the anemia persists or only the red blood cells return to normal. Liver extract, or whole liver, accelerates or initiates regeneration of the red blood cells to some extent but has little or no effect on the hemoglobin. Iron, in adequate dosage, causes rapid improvement in anemia of myxedema even in those patients who fail to improve on thyroid. Liver, plus iron, is probably no more effective than iron alone, although this combination may be of value in obtaining the last part of the improvement in the blood. In the practical management of myxedema, therefore, iron should be given in addition to thyroid when a condition of hypochromia persists, and liver extract should be given in those cases of myxedema presenting the blood picture of pernicious anemia.

New England Journal of Medicine, Boston

207: 523-558 (Sept. 22) 1932

Anatomy and Physiology of Congenital Cardiovascular Disease. A. C. Ernstene, Cleveland.—p. 523.
Congenital Heart Disease: Clinical Types and Diagnosis. H. B. Sprague, Boston.—p. 525.
Rheumatic Fever. T. D. Jones, Boston.—p. 529.
Diagnosis and Clinical Signs of Rheumatic Heart Disease in Children. W. B. Breed, Boston.—p. 530.
Treatment of Rheumatic Heart Disease. W. H. Robey, Boston.—p. 533.
Sources of Error in Blood Pressure Readings. H. W Dana, Boston.—p. 535.
Hypospadias and Epispadias: A Philologic Note. J. L. Bremer, Boston.—p. 537.
Etiology and Treatment of Chronic Arthritis. R. Burbank, New York.—p. 540.
Pilonidal Sinus: Review of One Hundred and Twenty Cases. F. Glenn, New York.—p. 544.

Ohio State Medical Journal, Columbus

28: 617-680 (Sept.) 1932

The Nature of Cancer. B. S. Kline, Cleveland.—p. 637.
Has Treatment of Diabetes Mellitus Become Too Technical? L. G. Heyn, Cincinnati.—p. 640.
Removal of Right Cerebral Hemisphere: Case Report. J. D. O'Brien, Canton.—p. 645.
Traumatic Neurosis Among Industrial Patients. J. Fetterman, Cleveland.—p. 650.
Prophylactic Use of Episiotomy in Primipara. H. A. Gusman, Cleveland.—p. 653.

Philippine Islands M. Assn. Journal, Manila

12: 305-358 (July) 1932

College of Medicine, University of the Philippines. S. de los Angeles, Manila.—p. 305.
Duties and Responsibilities of the Medical Profession. S. Y. Orosa, Bacolod.—p. 310.
University Health Service. A. V. Tupas, Manila.—p. 313.
Robert Koch and His Work. C. M. Hasselmann, Manila.—p. 328.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Urology, London

4: 209-306 (Sept.) 1932

Cystoscopic Appearances of Bilharziosis of Bladder. N. Makar.—p. 209.
Pathology, Diagnosis and Treatment of Two Cases of Malignant Disease of Testis. J. McClure, H. H. Sanguinetti and C. H. Carlton.—p. 217.
Some Observations on Urinary Infections Associated with Senile Enlargement of Prostate Gland. J. Gray.—p. 233.

British Medical Journal, London

2: 577-616 (Sept. 24) 1932

Uses of Nonspecific Protein Therapy. R. C. Low.—p. 577.
Otitis Media in Sucklings. W. M. Mollison.—p. 581.
Senescence. G. P. Bidder.—p. 583.
Experimental Study of Senescence. B. P. Wiesner.—p. 585.
Aneurysm of Abdominal Aorta and Thrombosis of Superior Mesenteric Artery Associated with Bullet Wound of Lung. J. Gilmour and S. McDonald, Jr.—p. 587.
*Observations on Treatment of Tetanus, with Especial Reference to Tetanus Antitoxin. B. B. Yodh.—p. 589.

Treatment of Tetanus.—Yodh briefly reviews 229 cases of tetanus, in the treatment of which antitoxin was used. Fourteen of these patients did not receive serum, of whom two with the disease in an extremely mild form recovered. The remaining cases were divided into two groups of 102 and 112. Patients in the group of 102 received an average dose of antitoxin of from 30,000 to 40,000 units intravenously and intramuscularly; 36 of these patients recovered and 66 died. In the group of 112 cases the antitoxin was administered intrathecally in the cisterna magna, as well as intravenously, intramuscularly and subcutaneously; 59 patients recovered and 53 died. The author believes that the following facts have been established: 1. The use of tetanus antitoxin in the treatment of tetanus is perfectly rational, is absolutely necessary, and should be used early and in large doses. 2. The combined intrathecal (cistern puncture), intravenous and intramuscular method of administration is superior to all the others. It definitely lowers the mortality rate and ameliorates the symptoms far more than does treatment by the intravenous and intramuscular routes alone. 3. The administration of the antitoxin into the cisterna magna is preferable to the lumbar puncture, as the former is nearer the vital centers. This method quickly neutralizes any toxin that might be there and is much easier to perform. 4. The cistern puncture, properly performed, has no dangers. Not one fatality could be attributed to the administration of the antitoxin by that route directly in the group of 112 cases. If the needle is not pushed beyond 5.5 to 6 cm. in adults there is no danger of puncturing the medulla. The author concludes that as the value of convalescent serum has been established in some infective conditions, it may be profitable to try its use in tetanus. Serum could be collected from convalescent patients and preserved for use in the place of the usual antitoxin.

Irish Journal of Medical Science, Dublin

No. **81:** 535-582 (Sept.) 1932

Pleural Effusions: Observations on Present Position of Treatment. E. T. Freeman.—p. 535.
Notes on Pyelography. T. A. B. Hayes.—p. 543.
Notes on Prostatic Drainage. T. J. D. Lane.—p. 551.
Modern Hospital Development. H. V. Lanchester.—p. 561.

Journal of Mental Science, London

78: 447-768 (July) 1932

Sinusitis and Mental Disorder: Clinical Manifestations. T. C. Graves.—p. 459.
Diagnosis of Focal Sepsis of Nose, Throat and Ear. P. Watson-Williams.—p. 645.
Pathology of Nasal Sinuses and Its Relation to Mental Disorder. F. A. Pickworth.—p. 653.
Bibliography of Previously Published Cases of Nasal Sinusitis and Mental Disorder. W. S. Adams.—p. 704.
*Ear, Nose and Throat Sepsis in Mental Disease. T. A. Clarke.—p. 705.

Ear, Nose and Throat Sepsis in Mental Disease.—The examination of 787 patients and a study of the literature has led Clarke to the following conclusions: 1. Focal sepsis can predispose to, and exaggerate the development of, mental symptoms; infection in the ear, nose and throat is likely to be particularly potent in so doing. 2. The incidence of ear, nose

or throat infection in mental disease is considerable (though less than has been suggested elsewhere); in every case, therefore, this region should be examined. 3. Drastic removal of septic foci, merely on the diagnosis of their existence, is no more to be commended in mental patients than in other persons. But, if other methods fail, such a procedure, carried out in a large number of cases, with adequate control, may become necessary; it may afford the only incontrovertible test of the influence of septic foci in producing and increasing mental abnormality. Meantime there is need for further investigation, clinical, postmortem and bacteriologic.

Journal of Physiology, London

76: 149-281 (Oct. 4) 1932

Action of Pituitary Posterior Lobe Extracts on Different Parts of Circulatory System. P. Holtz.—p. 149.
Resting Heat Production of Nerve. Mary Beresina.—p. 170.
Function of Adrenal Medulla. E. Annau, St. Huszák, J. L. Svirbely and A. Szent-Györgyi.—p. 181.
Supernormal Phase in Muscular Contraction. T. Kamada.—p. 187.
Effect of Injections of Extracts of Adrenal Cortex on Development and Sex Functions of Albino Mouse. R. A. Cleghorn.—p. 193.
Refractory Period of Mammalian Cardiac Muscle, with Especial Reference to Purkinje Tissue. A. S. Dale and A. N. Drury.—p. 201.
Action of Some Amines Related to Adrenalin: I. Methoxy-Phenylethylamines. D. Epstein, J. A. Gunn and C. J. Virden.—p. 224.
Studies on Physiology of Reproduction: IV. Changes in Adrenal Gland of Female Rat Associated with Estrous Cycle. Dorothy H. Andersen and Helen S. Kennedy.—p. 247.
Retrograde Polarization: Theory of Systematic Errors in Measurements of Muscular Chronaxia Through Ringer's Fluid or with Large Electrodes. L. Lapicque.—p. 261.

Journal of Tropical Medicine and Hygiene, London

35: 289-304 (Oct. 1) 1932

Dengue Fever. J. P. Cullen.—p. 289.
Paratyphoid C Case Reports from British Guiana. G. Giglioli.—p. 290.

Lancet, London

2: 605-660 (Sept. 17) 1932

*Bronchoscope in Treatment of Pulmonary Suppuration. A. J. S. Pinchin and H. V. Morlock.—p. 605.
Variations in Iodine Content of Blood in Hyperthyroidism and Nontoxic Goiter. E. C. Dodds, W. Lawson and J. D. Robertson.—p. 608.
Stenosis of Colon in Infancy. Anne E. Somerford.—p. 611.
Mental Effect of Complete Mastoid Operation in Children. M. Yearsley.—p. 613.
*Pathogenesis of Avitaminosis A: Vitamin A as Antikeratinizing Factor. L. J. Harris, J. R. M. Innes and A. S. Griffith.—p. 614.
Quantity of Vitamin A Present in Human Liver. L. K. Wolff.—p. 617.
Study of Nail-Bed Capillaries and Histamine Response in Rheumatism. A. A. Bissett and A. Woodmansey.—p. 620.

Bronchoscope in Treatment of Pulmonary Suppuration.—During the last eighteen months Pinchin and Morlock observed that, in a small series of eight acute cases of pulmonary suppuration, bronchoscopic drainage in addition to medical treatment seemed to produce a definitely higher proportion of cures, compared with medical treatment alone, and that in seventeen chronic cases of pulmonary suppuration, when medical treatment was of no avail, bronchoscopic drainage succeeded in producing a cure in nearly every case, without loss of life, while surgical procedures which they had done in the past have produced 65 per cent cures with 35 per cent loss of life; in addition, some of the cured patients have been left with persistent sinuses hard to heal and often necessitating several plastic operations. In bronchiectasis, abscess with bronchiectasis and bronchiectatic abscess, it has been found that bronchoscopic drainage, though not producing radical cures, is a palliative measure of considerable value.

Pathogenesis of Avitaminosis A.—Harris and his associates made a study of the development of the lesions of avitaminosis or hypovitaminosis A in rats. The metaplasia (or hyperplasia) and keratinization of epithelium was confirmed, and its loss of normal structure and function is regarded as the essential feature of the deficiency. The infections found in vitamin A deficiency are of a special type, limited in origin to epithelial tissues and not seen in the absence of neighboring keratinization. They appear, that is, to be attributable to the xerosis, deficient secretion of mucus, and desquamation (which may set up local irritation, obstruction in ducts, and so on). With provision of vitamin A, the epithelium becomes normal again and the local infections disappear. If the avitaminosis is allowed to develop, the local infections spread and the destruction of the integrity of the epithelium is presumably responsible for absorption of the fortuitous infecting micro-organisms (normally nonpathogenic) and septicemia may result. The claim that rats become susceptible to tuberculosis when depleted of vitamin A, which appears to support the theory of a generalized antiinfective action for the vitamin, could not be substantiated. When the bacillus was fed by mouth, some evidence was obtained suggestive of increased absorption in vitamin A deficient rats but not of any lowered general resistance to the spread of tuberculous disease. The existing data afford no basis for the belief that vitamin A therapy is likely to be effective in combating acute general infections due to specific highly pathogenic micro-organisms, or in those clinical toxemias and infectious diseases which are unassociated with the peculiar structural breakdown of epithelial tissue, and the attendant localized infection, which characterizes the vitamin deficiency.

Medical Journal of Australia, Sydney

2: 347-374 (Sept. 17) 1932

Morbidity and Mortality in Convict Settlement at Port Arthur, Tasmania, from 1830 to 1835. J. B. Cleland.—p. 347.
Sinusitis and Tuberculous Infection. S. Pern.—p. 350.
Spontaneous Subarachnoid Hemorrhage. A. S. Walker.—p. 353.
Rotation of Eyeball. K. F. Russell.—p. 355.
Superfluous Hair: Its Permanent Removal by Elective Electrolysis et Cetera. H. Lawrence.—p. 356.
Note on Diastolic Pressure of Zero. P. G. Dane.—p. 360.

2: 375-404 (Sept. 24) 1932

Some Aspects of Gallstone Disease. I. Hamilton.—p. 375.
Principles of Normal Diet. R. S. Steel.—p. 383.
Disappearance of Leprosy from Great Britain. H. Sutton.—p. 387.

2: 405-436 (Oct. 1) 1932

*Erythrocyte Sedimentation Rate in Pulmonary Tuberculosis and Other Pulmonary Diseases. C. Harvey and Muriel Reid.—p. 405.
Median Pressure and Hypertension Moyenne Solitaire Syndrome: Some New Aspects of Oscillometry. C. Shellshear and C. Sippe.—p. 412.

Erythrocyte Sedimentation Rate.—Harvey and Reid determined the rate of sedimentation of the red blood cells on 224 patients suffering from pulmonary tuberculosis and other diseases. They made an analysis of the figures in order to assess the diagnostic and prognostic value of the test. They conclude that: 1. The erythrocyte sedimentation test performed with a minute volume of blood, and employing the one hour reading, is entirely reliable and is easily carried out. 2. The sedimentation rate has a limited but definite diagnostic value in indicating the presence or absence of serious inflammatory disease. 3. The sedimentation rate in pulmonary tuberculosis (taken in conjunction with the clinical symptoms) gives a reliable indication of the activity of the disease. 4. The sedimentation rate has a definite prognostic value in observing the course of chronic disease associated with tissue destruction. 5. The sedimentation rate is of definite value in observing the result of treatment, especially in artificial pneumothorax therapy.

Japanese Journal of Obstetrics and Gynecology, Kyoto

15: 184-262 (June) 1932

Fibromyoma of Portio Vaginalis Uteri. Y. Ikeda and K. Ikeda.—p. 184.
Diabetes Insipidus in Uterine Myoma and Menorrhagia. Y. Ikeda and K. Ikeda.—p. 187.
Experimental Study of Thyroid Function During Pregnancy, Parturition and Puerperium: Part I. Metabolism of Iodine During Pregnancy and Puerperium. U. Nakamura.—p. 190.
Clinical Observations of Stroma Reaction in Carcinoma of Portio Vaginalis. J. Toyoshima.—p. 203.
Doubts on the Cause of Zondek-Aschheim's Reaction (Z. A. R.) of Pregnancy. K. Mizuno.—p. 206.
Supplementary Investigation of Function of Hypophysis: Part I. Effects of Complete Destruction of Hypophysis on General Condition of Rabbit. M. Ikeda.—p. 213.
Id.: Part II. Observations of Changes in Blood of Rabbits, the Hypophysis of Which is Completely Destroyed. M. Ikeda.—p. 225.
Effects of Light on the Healing of Wounds. T. Fuke.—p. 234.

Journal of Oriental Medicine, South Manchuria

17: 1-8 (July) 1932

Muscles of Mastication of Chinese. Y. Nakayama.—p. 1.
Studies on Toxin of Typhosus: Part III. Immunization with Culture Filtrate, Nucleoprotein and Refined Toxin. M. Yato.—p. 4.
Influence of Various Living Conditions on Distribution and Displacement of Iodized Poppy-Seed Oil in Abdominal Cavity. G. Irie.—p. 5.
Effect of Blood Transfusion on Immune Bodies: I. Blood Transfusion and Agglutinin. M. Okamoto.—p. 7.

Policlinico, Rome

39: 493-552 (Oct. 1) 1932. Medical Section

*Tuberculous Bacillemia According to Löwenstein's Cultural Method. A. Gualdi.—p. 493.
Therapeutic Action of Epinephrine-Like Substances in Certain Conditions of Circulatory Collapse. V. Serra.—p. 504.
Dextrose Therapy of Jaundice. L. Winternitz.—p. 524.
Anatomic Contribution to Study of Gynecomastia During Chronic Pulmonary Tuberculosis. D. Bettini.—p. 534.

Tuberculous Bacillemia According to Löwenstein's Method.—Gualdi uses the culture medium and technic of Löwenstein in studying the possibility of isolating the tubercle bacilli from the blood of patients with various clinical forms of tuberculosis and with rheumatic infections. In thirty cases of tuberculosis only one positive blood culture was obtained. In seven cases of rheumatic infection the blood culture was constantly negative. The author concludes that (1) the number of positive blood cultures he obtained by the Löwenstein method is less than that obtained by Löwenstein; (2) negative blood cultures in tuberculosis demonstrate the difficulty of isolating the tubercle bacilli from the blood and of obtaining the bacilli in culture by the means known at present, rather than the absence of a tuberculous bacillemia.

39: 1533-1568 (Oct. 3) 1932. Practical Section

Differential Diagnostic Aspects of Case of Splenomegaly. A. Gasbarrini.—p. 1533.
Treatment of Pulmonary Tuberculosis with Gold Salts. G. Fabri.—p. 1540.
*Periodic Colic of Urinary Bladder Due to Repeated Incarceration of Small Suprapubic Inguinal Cystocele. E. Fiorini.—p. 1544.

Colic of Urinary Bladder.—Fiorini discusses the literature of urinary cystocele and states that incarceration of the diverticulum rarely occurs. He reports a case in which the urinary colic was accompanied by pain radiating to the slightly deformed right groin, especially during urinary distention. Diagnosis was made on interrupted micturition, the results of a thorough cystoscopic and roentgenologic examination, palpation of a sac with thick walls and the possibility of causing bladder disturbances by traction on the sac. Diagnosis was confirmed at operation.

Deutsches Archiv für klinische Medizin, Berlin

174: 1-112 (Sept. 23) 1932

Extrarenal Elimination of Water in Cardiac Insufficiency. H. Magendantz and F. Stratmann.—p. 1.
*Treatment of Exophthalmic Goiter by Injections of Animal Blood. W. Nagel.—p. 6.
Investigations on Energy Metabolism and on Basal Metabolism in Severe Diabetes. P. Müller.—p. 20.
General Validity of Law of Hughlings Jackson. F. W. Bremer.—p. 48.
Hypertension and Fundus Oculi, with Especial Consideration of Constitutional Hypertension. R. Scheerer and C. Ernst.—p. 64.
*Significance of Chronaxia in Internal Medicine: Alteration of Nervous Reaction by Administration of Acid and Alkali. T. Johannes.—p. 83.

Treatment of Exophthalmic Goiter by Injections of Animal Blood.—Encouraged by the report of Zimmer that injections of animal blood produce favorable results in exophthalmic goiter, Nagel tried injections of sheep blood and of beef blood in the treatment of fourteen patients with exophthalmic goiter. He concluded that injections of animal blood are of no value whatever in the treatment of exophthalmic goiter.

Significance of Chronaxia in Internal Medicine.—Johannes studied the influence of prolonged administration of substances inducing acidity (ammonium chloride) or alkalinity (sodium bicarbonate) on the electrical excitability of the extensor digitorum communis by means of the chronaximeter. He observed manifold reversing actions, increases and decreases as well as considerable fluctuations. If the acid medication is continued, the well known initial phase with its decrease in the chronaxia values is followed by an increase and this in turn is frequently followed again by a reduction. If alkali treatment is continued for a considerable length of time, the initial increase in the chronaxia values is followed by a decrease. In general, the values during acid administration are lower than those during alkali administration. The influence of the preliminary period is of greatest significance. The hyperventilation curves are higher and longer if alkali is administered, but if acid is given they return after a rapid increase quickly to normal values. These actions become more pronounced with increasing doses. If stasis is produced in the other arm, acid medication effects a more intense reaction; that is, higher increase of values with retarded return to normal values; administration of alkali, however, produces less or no increase, and occasionally shortening of the reaction. The author discusses the connection between the results of these tests and the metabolic processes that take place following acid and alkali administration.

Deutsche Zeitschrift für Chirurgie, Berlin

237: 185-352 (Sept. 29) 1932

Experimental Traumatic Intracranial Pressure. R. Wanke.—p. 185.
*Sarcoma in Relation to Osteitis Deformans and Osteodystrophia Fibrosa. R. Wanke.—p. 198.
*Value and Rôle of Roentgen Studies in Clinical Course of Tuberculosis of Vertebral Bodies. K. Lindemann.—p. 234.
*Diagnosis of Tuberculosis of Knee, with Especial Consideration of Value of Biopsy and A. T. Reaction. W. Siemens.—p. 292.
Treatment of Fractures of Middle of Neck of Femur. K. Lepehne.—p. 321.
Joint Disease of Right Hip Caused by Filaria Loa. H. Neumann.—p. 331.
Skin Emphysema After Injury to Scrotum. K. Specht.—p. 343.

Sarcoma in Relation to Osteitis Deformans.—Wanke states that his personal observations as well as recent literature support the old dictum of Paget's that a definite predisposition to sarcomatous degeneration exists in cases of osteitis deformans. The presarcomatous nature of the latter is strikingly demonstrated in cases in which multiple sarcomas develop. He observed one case of this type and found six similar cases in the literature. Altogether the literature contains fifteen cases of osteitis deformans complicated by sarcomatous degeneration. While accurate statistics do not exist, the actual percentage of sarcoma developing on the basis of osteitis deformans is small. The neoplasm appears either in circumscribed or in diffuse form. The author had reported one such case in 1927 but was not able to find an additional one in forty-one observed cases of osteitis fibrosa lasting for periods of from ten to twenty-seven years. He regards cases reported in the literature with suspicion and believes that they were primary sarcomas of relatively mild malignancy, roentgenologically and histologically resembling osteitis fibrosa rather than cases of sarcoma developing on a basis of localized fibrous osteitis.

Roentgenologic Studies in Tuberculous Spondylitis.—Lindemann states that roentgen observation is seldom of value in the diagnosis of early cases of tuberculous spondylitis. The attempt to correlate anatomic-pathologic changes with roentgen presentations is likewise unsuccessful. Local reparative processes are roentgenologically demonstrable. It is possible to differentiate a localized from a diffuse lesion. Generally speaking, the less tissue destruction, the more complete is the regeneration. So-called benign tuberculous spondylitis manifests itself in a localized lesion. Coexistence of tuberculous foci elsewhere does not materially influence the prognosis of such cases. He regards primary localization of the tuberculous process in the intervertebral disks as unusual and exceptional. Abscess did not develop in only 9 of 120 clinically and roentgenologically proved cases of dorsal and lumbar spondylitis. Roentgen investigation is most reliable for the demonstration of an intrathoracic abscess.

Diagnosis of Tuberculosis of Knee.—Siemens was able to diagnose the tuberculous nature of knee disorders in 53 per cent of his cases on clinical evidence alone. Important in the evidence were the local conditions, the roentgen evidence and the long duration of the disease. The occurrence of skeletal tuberculous changes elsewhere or swelling of the knee in childhood clarified the diagnosis. For the rest of the cases, special methods were required. Of these, biopsy of the knee capsule has proved to be reliable in 100 per cent of the cases. Histologically proved cases of nontuberculous synovitis have not in a single instance proved to be tuberculous in a later follow-up study. The author made use of the tuberculin test and found that it was positive in about 80 per cent of the positive cases. It was negative in about the same percentage of negative cases. It could not therefore be considered specific. A negative test is of greater value than the positive. The absence of local, focal and general reaction strongly sug-

gested a nontuberculous process. Particularly suggestive was the lack of temperature reaction. The biologic test in the author's experience occasionally proved negative in a definite case of knee tuberculosis and positive in a nontuberculous case. The method of erythrocyte sedimentation proved of no value.

Medizinische Klinik, Berlin

28: 1335-1374 (Sept. 23) 1932

Hematogenic Pulmonary Tuberculosis. H. Assmann.—p. 1335.
Mechanical and Chemical Digestion Processes in Ruminants. E. Mangold. —p. 1336.
*Dangerous Methods of Interruption of Pregnancy. K. Reuter.—p. 1339.
*Relation Between Growth Potency of Tumors and Their Vitamin A Content. E. Vogt.—p. 1344.
Changes in Surgery of Exophthalmic Goiter. F. Kerschner.—p. 1345.
Detection of Pulmonary Tuberculosis in General Practice. J. Rating. —p. 1348.
Combined Calcium-Digitalis Treatment in Pneumonia. E. Hellmann. —p. 1349.
Polyneuritis in Malignant Diphtheria. B. Habel.—p. 1351.
Peculiar Forms of Dynamic Rapport, Particularly Tension Rapport. H. Fendel.—p. 1352.

Dangerous Methods of Interruption of Pregnancy.—Reuter calls attention to the danger of fetal air embolism when fluids are introduced into the gravid uterus for the purpose of interruption of pregnancy. He therefore warns against all injection methods, even the injection of tincture of iodine. He further shows that the various iodine ointments that recently have been recommended as harmless abortifacients are dangerous, particularly when the melting point of the ointment is low, for in that case the danger of embolism is considerable. Even if the melting point is comparatively high there is danger of embolism, and he advises against these abortifacients.

Growth Potency of Tumors and Their Vitamin A Content.—Vogt shows that vitamin A, the growth vitamin, which has heretofore been demonstrated in human beings only in the liver and in fat tissues, is present also in benign and malignant tumors. He found that in myomas vitamin A is either entirely absent or is present only in small amounts. Two sarcomatous neoplasms contained demonstrable but small quantities of vitamin A. In carcinomatous neoplasms there were always certain amounts of vitamin A. The vitamin content was most pronounced in cases in which clinical observation revealed a rapid growth, and the histologic structure corroborated the rapid growth in these cases. These investigations reveal a connection between growth potency of tumors and their content in vitamin A. The richer in cells and the more rapid the growth of a malignant epithelial tumor, the higher is its content in vitamin A.

28: 1415-1450 (Oct. 7) 1932

Purgative Remedies. H. Handovsky.—p. 1415.
*Irradiation in Treatment of Exophthalmic Goiter. F. Bardachzi and R. Epstein.—p. 1417.
Pathogenesis of Amyotrophic Lateral and Multiple Sclerosis. H. Gerhartz.—p. 1422.
Treatment of Whooping Cough. H. Steuernthal.—p. 1425.
Scarless Reconstruction of Nose Injured in Childhood. O. Heinemann. —p. 1427.
Influence of Diet Rich in Carbohydrates on Tolerance of Diabetic Patients. O. Porges and D. Adlersberg.—p. 1428.
Idem. G. Czoniczer and E. Kolta.—p. 1430.
Growth Substances in Plants. F. Hoder.—p. 1430.
Experimental Modification of Tumor Metabolism in Living Animals. M. Reiss and A. Hochwald.—p. 1432.

Irradiation in Treatment of Exophthalmic Goiter.—Bardachzi and Epstein believe that one-sidedness in favor of internal treatment, surgical intervention or irradiation should be avoided in the therapy of exophthalmic goiter. Since operation gives the most rapid results, it should be resorted to in the cases suited for it and when social factors necessitate quick action. However, the favorable influence of irradiation in severe exophthalmic goiter justifies its trial. If, after two or three months, the desired improvement has not been obtained, operation should be resorted to. In persons who fear an operation or for whom an operation is dangerous, the irradiation should be continued. In severe cases it is essential that the treatment be started with small doses, and it is often helpful to supplement the ray action by careful treatment with iodine. In the most severe cases, those in which coma and psychoses are liable to occur, the irradiation should be preceded by internal measures, especially iodine treatment. In patients with hyperthyroidism who show signs of compression, surgical intervention is advisable. However, if the hyperthyroidism develops on a degenerative, constitutional basis, that is, if pluriglandular disturbances exist, as is the case particularly in menopausal disturbances, operation is not advisable. In these cases it is frequently helpful to supplement internal therapy by irradiation of the incretory organs involved in the pluriglandular disturbance. Toxic adenomas that seem suited for operative treatment should be operated on, but in many of these cases it is advisable first to counteract the manifestations of intoxication by irradiation.

Monatsschrift für Kinderheilkunde, Berlin

55: 1-80 (Sept. 22) 1932

*Congenital General Enchondromatosis. H. Fernbach.—p. 1.
Diagnostic Difficulties in Mitral Insufficiency Beginning in Childhood. E. Hergloz.—p. 15.
*Form of Epilepsy Concurring with Temporary Flaccid Paralysis in Children. W. Birk.—p. 28.
Hepatolienography in Growing Organism. J. Jochims.—p. 39.
*Treatment of Epilepsy in Children by Means of Ketogenic Diet. O. Beck.—p. 47.

Congenital General Enchondromatosis.—Fernbach relates the history of a girl, aged 12, with multiple enchondromas of the entire skeleton. It is probable that the tumor anlagen date back to fetal life. The clinical manifestation of the tumors began after the second year of life and they developed slowly in the course of the following ten years. Because of concurrence with a multiple tuberculosis of the lymph nodes, the differential diagnosis from tuberculosis was difficult and the roentgenologic aspect of the bones made a differentiation from osteodystrophia cystica fibrosa generalisata difficult. The exact diagnosis enchondroma was possible only after histologic examination of the extirpated tissues. On the basis of the reported case the author shows the significance of the histologic examination for diagnosis and for treatment because, although in the case of neoplasms the removal of some of the growths and cysts may be helpful, osteodystrophia fibrosa is best influenced indirectly by extirpation of the parathyroids.

Epilepsy Concurring with Temporary Flaccid Paralysis in Children.—Birk describes attacks of paralysis that he observed in three children. These attacks developed at the end of the first year of life. They involved either the extremities or the facial muscles innervated by the facialis. The paralysis was always of the flaccid form; there were no changes in the reflexes, no disturbances in the consciousness, no electrical modification of the musculature, no sensitivity disturbances and no involvement of the sphincters. The attacks, usually lasting from two to three days, sometimes were proceded by a sort of aura. During the attack-free periods, of from eight to fourteen days' duration, the children usually appeared entirely normal. The attacks still persist and in one of the children they have been observed for four years. The character of the attacks has remained essentially unchanged, but in one of the children a certain progressiveness of the disease has become noticeable and an impairment of the mental capacity is evident. The latter factor, also the attackwise occurrence, as well as the periodicity of the course, the presence of an aura, and the fact that in one child absences were occasionally noticed, gave rise to the thought that the conditions are perhaps of the same nature as Jackson's epilepsy. This assumption gained further support from the fact that in two of the children epilepsy-like convulsions occurred, which, however, never recurred. Consequently the author assumes that the temporary flaccid paralysis is a special form of infantile epilepsy.

Ketogenic Diet in Treatment of Epilepsy.—In reporting his observations on the course of epilepsy in children under the influence of a ketogenic diet, Beck attempts to answer the following two questions: 1. Does the ketogenic diet produce better results than the other methods usually employed in the treatment of epilepsy in children? 2. Can a ketogenic diet be continued for longer periods without injuring the child so treated? In answer to the first question he states that the ketogenic diet does not accomplish more than the former customary methods of treatment, for neither the number nor the types of attacks are influenced favorably. In regard to the

second question he states that it is not a harmless method of treatment, for in addition to slight impairments that were noted in nearly all cases it is possible that a diet deficient in carbohydrates, when it is continued for long periods, may lead to acute loss of function of the insular apparatus of the pancreas and thus produce life-endangering conditions. A ketogenic diet is also contraindicated because it is expensive and because its continuation for long periods involves considerable difficulties.

Münchener medizinische Wochenschrift, Munich

79: 1625-1664 (Oct. 7) 1932

Sclerodermia and Acrosclerosis (Sclerodactylia), Ferment Therapy. J. Sellei.—p. 1625.
House Physician and Articular Rheumatism. A. Schmidt.—p. 1629.
Phagocytosis. H. F. von Kress.—p. 1631.
*Dietary Treatment in Tuberculosis. H. Baumgartner.—p. 1632.
Alcohol-Free, Refreshing Drink of Beer Character and of High Caloric Value. B. Bleyer, W. Diemair and F. Fischler.—p. 1634.
*Electro-Encephalogram of Human Beings. H. Berger.—p. 1636.
Diagnosis and Treatment of Intestinal Invagination. C. Pfeiffer.—p. 1638.
Ureteral Fistulas in Women. G. Frommolt.—p. 1638.
*Treatment of Erysipelas by Roentgen Rays. E. Notger von Oettingen.—p. 1640.
Rare Injury by Bite of Monkey. L. Frankenthal.—p. 1641.
Prognosis of Coma Diabeticum. F. Bertram.—p. 1643.
Critical Review of Anesthesia Methods. E. Rehn and H. Killian.—p. 1646.
Parathyroid Therapy in Dermatology. W. Richter and E. Herzfeld.—p. 1650.

Dietary Treatment in Tuberculosis.—Baumgartner relates his experiences with a diet deficient in sodium chloride, which he employed in the treatment of cutaneous, pulmonary and surgical tuberculosis. The extreme regimen of Gerson was followed only in a small number of cases, the dietary regulations of Sauerbruch and Herrmannsdorfer were adhered to only in the first two years, and later, although the sodium chloride restriction was continued, the carbohydrate and protein limitation was not followed so strictly. On the basis of his experiences, the author reaches the following conclusions: The diet deficient in sodium chloride exerts no noticeable influence on predominantly suppurative inflammations; that is, on inflammations that are rich in leukocytes. However, in inflammations with predominantly exudative, that is, leukocyte deficient, character the exudation inhibiting character of a salt-deficient diet becomes evident. The decrease in exudation goes parallel with the decrease in the sodium chloride intake. The author thinks that von Noorden's characterization of the salt-free diet as antiinflammatory should be modified by ascribing it to a part of the inflammatory action; namely, to exudation. Since around every tuberculous focus in a certain developmental stage there probably takes place a perifocal exudative inflammation, it is advisable to resort to sodium chloride limitation during this stage, because no medicament has such an inhibitory effect on exudation. After an exudative process has been transformed into a more dry, shrinking process, the sodium chloride limitation can be somewhat relaxed, according to the degree of predisposition for exudation. The author closes with the reminder that the early overevaluation of the curative value of a salt-free diet has now been realized, but he considers it deplorable that the advantages that result from this dietary treatment, when employed in the right cases, should remain unused.

Electro-Encephalogram of Human Subjects.—Berger states that although electrical processes of the cerebrum were demonstrated in animals as early as 1874, in human beings it was not done until he succeeded in 1924. He relates that his first tests were all made on patients who had been trephined, but later he devised a method by which it was possible to register the electrical currents on the intact skull. His latest tests were made with an especially constructed oscillograph. He asserts that the electro-encephalogram is not influenced by vascular changes, such as the degree of filling of the cerebral vessels, but he maintains that it records bio-electrical manifestations that are connected with the activities of the cerebral cortex. During the first six weeks of life the electro-encephalogram is negative; the author is of the opinion that this is the result of the immaturity of the cerebral cortex of the new-born. After the sixth week of life it becomes demonstrable, but not until after the fourth year of life does it have the form which it has during later life. The automatic action of the cerebral cortex, which becomes manifest in the electro-encephalogram, continues during sleep, but during loss of consciousness, such as that which persists after a violent epileptic attack, the electro-encephalogram is negative. It also gradually subsides during chloroform anesthesia and then gradually becomes positive again. Medicaments that inhibit the action of the cerebral cortex cause a decrease in the deflections of the electro-encephalogram, but medicaments such as cocaine that stimulate the activity of the cerebral cortex cause larger deflections. The electro-encephalogram also changes during fever, carbon monoxide poisoning, concussion and contusion of the brain, hydrocephalus, tumor, and cerebral hemorrhage. The author shows several graphs on which both the electrocardiogram and the electro-encephalogram are recorded.

Treatment of Erysipelas by Roentgen Rays.—Notger von Oettingen, after giving a tabular report showing the various authorities who employed roentgen therapy in erysipelas and the results obtained by them, states that, of seventy-eight patients with erysipelas who received roentgen treatment in the Würzburg clinic in the years 1926 to 1932, sixty-four reacted promptly. In regard to the technic he states that the so-called irritating doses were employed; that is, not less than 10 per cent of the unit skin dose and not more than 25 per cent. As much as possible the entire diseased area was exposed to the rays and if because of considerable extension this was not possible, an attempt was made to influence at least the margins of the diseased region, which occasionally necessitated the irradiation of several fields. When the first irradiation did not check the further spread of the erysipelas, the author gave a second irradiation after forty-eight hours. In this respect he differs from other authors who recommend a second irradiation only after seven or eight days. In discussing the effects of roentgen treatment he states that roentgen irradiation not only counteracts the general manifestations, particularly the pulse and temperature increases, but also exerts a curative influence on the local manifestations. In the final summary of his paper he states that the aim of his report was to add the seventy-eight cases to the general casuistics of roentgen treatment in erysipelas and to call attention to roentgen therapy as a rapid and simple method.

Acta Dermato-Venereologica, Stockholm

13: 303-373 (Oct.) 1932. Partial Index

Prevention of Syphilis by Liposoluble Bismuth Salts. C. Levaditi, G. Roussel, A. Vaisman, Y. Manin and R. Schoen.—p. 303.
Genital Gonorrhea Acquired by the New-Born at Time of Parturition. A. F. Vilén.—p. 315.
*New Form of Cicatricial, Atrophic, Angiomatous Telangiectasis. L.-M. Pautrier.—p. 347.
Venereal Granuloma. P. L. Rotnes.—p. 359.
Therapeutic Experiments with Antirabies Virus of Pasteur in Dementia Paralytica and Tabes. L. Tommasi.—p. 366.

New Form of Cicatricial, Atrophic, Angiomatous Telangiectasis.—Pautrier reports the case of a woman with an atypical form of vascular lesions, intermediate between telangiectases and angiomas but more closely resembling telangiectases and terminating spontaneously either in an atrophic stage or a veritable scar formation resembling maculopapular erythrodermia. The lesions first appeared at the age of 14 on the neck and later spread to the face, arms and upper part of the trunk. They were of variable size and shape and of a vivid rose color. Biopsy of an atrophic plaque showed, in addition to a decrease in the thickness of the corium and a total absence of elastin, the existence of cellular infiltrations surrounding most of the capillaries. The infiltrations were in the form of dense voluminous nodules consisting of lymphocytes, hystiocytes and connective cells. The extent of the dermic infiltrations, spread in large nodules around the capillaries, the chronic inflammation of which they are evidence, the dermic atrophy and disappearance of the elastin and the clinical atrophy and scars in which the lesions end, set this case apart clinically. Clinical examination and anamnesis revealed nothing to explain the pathogenesis. The author thinks that vasomotor emotional disturbances, manifest at examination in the form of spasms resulting in a cadaverous color of the hands and forearms, are not sufficient to explain these unusual lesions accompanied by atrophies.